

Fit Happens: Essential Principles of Fitness, Wellness, and Health: Lab Activities

Danielle Altman, Rusty Johnson, and Cheryl Owiesny

De Anza College

Medicine

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Fit Happens: Essential Principles of Fitness, Wellness, and Health - Lab Activities



[On Starting Line; Nicolas Hoizey via Unsplash](#)

Danielle Altman, Rusty Johnson and Cheryl Owiesny

De Anza College

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TABLE OF CONTENTS

Licensing

Program Page

Accessibility Statement

Attribution and OER Revision Statement

Dedication

About the Book

About the Authors

1: Introduction to Wellness, Fitness, and Lifestyle Management

1.1: Lifestyle Evaluation and Behavior Modification (Lab 1.1)

1.2: S.M.A.R.T. Goal Worksheet (Lab 1.2)

2: Principles of Physical Fitness

2.1: Barriers to Being Active Quiz (Lab 2.1)

2.2: Activity Log (Lab 2.2)

3: Cardiorespiratory Endurance

3.1: Cooper 1.5 Mile Run/Walk Assessment (Lab 3.1)

3.2: One-Mile Walk Test (Rockport Walk Test) (Lab 3.2)

3.3: 12 Minutes Cooper Run (Lab 3.3)

3.4: 12-Minute Swim Test (Lab 3.4)

3.5: 3-Minute Step Test (Lab 3.5)

3.6: Beep Test (Lab 3.6)

4: Muscular Strength and Endurance

4.1: Assessing Functional Strength

4.2: Assessing Muscle Strength

4.3: Assessing Muscular Endurance

4.4: Creating a Program

5: Flexibility, Mobility, and Low-Back Wellness

5.1: Assessing Flexibility

5.2: Creating a Program

5.3: Evaluating Posture

6: Body Composition

6.1: Body Mass Index Calculations

6.2: Body Fat Distribution Calculations

6.3: Setting Body Composition Goals

7: Creating a Fitness Program for Lifelong Health

7.1: Physical Activity Diary (Lab 7.1)

7.2: Evaluating Fitness Apps and Wearable Fitness Devices (Lab 7.2)

7.3: Person Fitness Program Plan (Lab 7.3)

8: Nutrition

8.1: Calculating TDEE and Macronutrient Intake Goals

9: Weight Management for Health and Wellness

9.1: Weight Management Goal Setting Strategies

9.2: Your Diet vs MyPlate

10: Stress, Sleep, and Mental Health

10.1: Personal Stress Inventory

10.2: Reduce Stress in 10-Minutes

11: Cardiovascular Disease, Diabetes and Cancer

11.1: Personal Risk Assessment

12: Relationships, Immunity, and Disease Prevention

12.1: Developing a Personal Plan for STI Prevention

13: Substance Use and Misuse

13.1: Alcohol Use Survey

13.2: Addictive Behavior Checklist

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Program Page



De Anza College sits in the heart of Silicon Valley, where innovation and opportunity are part of daily life, and also has one of the highest costs of living in the country. For our students, that makes every dollar count, and the price of a textbook can be the difference between staying enrolled or dropping a class. Our Zero Textbook Cost (ZTC) program closes that gap by giving students full access to high-quality, faculty-created course materials at no cost from the first day of class.

De Anza is proud of its diverse student community, and we hold our ZTC materials to the same standard of excellence that defines the college. Faculty across departments write, adapt, and review these resources themselves, keeping them accurate, current, and grounded in the perspectives of the students who use them, with accessibility and inclusive design built in from the start.

This program reflects the time and care our faculty invest in their students. If you have questions, feedback, or come across any issues with a ZTC resource, contact De Anza College's ZTC Grants Coordinator, [Shagun Kaur](#).

Learn more about [De Anza ZTC Program](#) [www.deanza.edu/academic-services/oer/]

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Accessibility Statement

Accessibility

De Anza College is dedicated to creating learning materials that are accessible and benefit all students. Our materials follow the Web Content Accessibility Guidelines (WCAG) 2.1 Level AA. Our authors and contracted accessibility specialists checked all resources using this ASCCC OERI checklist, the accessibility tool in LibreTexts, WAVE, JAWS, and other more detailed checks for complex materials such as interactive components.

We selected LibreTexts as our preferred platform because of its [commitment to accessibility](#). In addition to the platform's inherent accessibility, we collaborated with the LibreTexts team to fix any accessibility issues we found.

Our Accessibility Review Process

Accessibility was built into the resource as it was written. This resource went through the following stages of review:

1. **Template check.** The project coordinator and instructional designers checked the first chapter for accessibility as a model to ensure later chapters meet accessibility standards.
2. **Progress checks.** The manuscript was checked at approximately 40%, 60%, and 80% completion to catch and correct accessibility issues in production.
3. **Specialist review.** Once the manuscript was complete, an accessibility expert conducted an accessibility check.
4. **Remediation.** The author and the project manager who conducted the earlier progress checks worked together to remediate the issues identified by the accessibility expert.
5. **Final check.** The resource underwent another full check by the accessibility expert before the book was deemed ready for publication.

This process combines ongoing checks during writing with a final specialist review, so issues are caught early and confirmed fixed before publication.

Report an Accessibility Problem

We are always looking for ways to make our resources more accessible. If you run into a barrier while using this resource, please let us know so we can look into it. When you [contact us](#), it helps to include:

- The name of the resource
- The location of the problem (a web address or page/chapter description)
- A description of the problem you encountered
- The device, browser, and any assistive technology you were using (e.g., Windows 11, Google Chrome, JAWS screen reader)

Contact us: [De Anza ZTC team](#)

This statement was last updated August 2026

This resource was project-managed by **Shagun Kaur**, overseeing scope, budget, and schedule; stakeholder coordination via monthly meetings; training and platform support (LibreTexts, troubleshooting, technical support); QA/accessibility check scheduling; and licensing and copyright governance.

A Note on Known Limitations

No accessibility check is perfect. We've made a genuine, sustained effort to catch and fix issues throughout the writing and review process described above, but some barriers may remain, especially in complex or interactive content. We'd rather be upfront about that than claim a standard of perfection we can't guarantee.

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Attribution and OER Revision Statement

AI Use in Course Development – Transparency & Standards

As part of the development process for this textbook and its accompanying course materials, we utilized artificial intelligence (AI) as a supportive educational technology to assist with idea generation, content organization, and early-stage drafting. Our use of AI was guided by principles of transparency, academic integrity, accessibility, and human oversight. At no point was AI used as a substitute for faculty expertise, scholarly judgment, or pedagogical decision-making.

Specifically, we deployed a custom, equity-aware chatbot that was prompt-engineered to align with our educational goals and informed by Open Educational Resources (OER), scholarly materials, and other openly available educational content. The purpose of this tool was to assist with brainstorming, generating potential examples, identifying organizational structures, suggesting learning activities, and helping authors overcome common challenges associated with drafting and revising educational materials.

The AI's role was limited to ideation and preliminary content generation. All AI-generated material underwent extensive review, revision, verification, and editing by the course authors. Faculty members evaluated content for accuracy, clarity, inclusivity, accessibility, relevance, and alignment with course learning outcomes. In many cases, AI-generated text served only as a starting point and was substantially modified, expanded, reorganized, or rewritten during the development process.

We also recognized that AI systems can reflect biases, inaccuracies, omissions, or outdated information. For this reason, no content was accepted without human review and independent verification. All factual claims, educational recommendations, examples, and references were evaluated against current evidence, professional standards, and the authors' subject matter expertise. Responsibility for the content ultimately rests with the human authors, not the technology used during development.

Our use of AI mirrors how many professionals increasingly use emerging technologies in education and the workplace: as tools that can enhance efficiency, creativity, and productivity while still requiring critical thinking, ethical judgment, and expert oversight. By incorporating AI transparently and responsibly, we sought not only to improve the development process but also to model thoughtful technology use for students navigating an increasingly digital and AI-assisted world.

Finally, we believe that innovation must be balanced with a commitment to equity and accessibility. Throughout the development process, all content was reviewed to ensure it met accessibility standards and supported diverse learners. AI-assisted drafting was only one component of a much larger process that included faculty collaboration, scholarly review, accessibility evaluation, and continuous revision. The result is a resource that reflects both the opportunities offered by emerging technologies and the enduring importance of human expertise in teaching and learning.

Copyright & Fair Use Considerations

We aligned with evolving IP policy frameworks, especially insights from the U.S. Copyright Office:

- The [Office's Part 3 report on AI model training](#) highlights the importance of fair use analysis and restricts reliance on generative AI when it could replicate copyrighted works—our use was limited to non-protected, openly licensed materials.
- This cautious approach is consistent with [guidance](#) that encourages transformative use, transparency, and limiting output that could inadvertently mirror protected content.

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Dedication

Dear readers:

It is very exciting to share this book, “Fit Happens: Essential Principles of Fitness, Wellness, and Health,” as an Open Educational Resource (OER). Writing this book has been a journey for the authors, and we have all had to challenge ourselves to create something that we hope will be beneficial to so many, but please know it is also truly close to our hearts. We thank all the OER pioneers who came before us and appreciate the many resources that were available to create this book.

This book is dedicated to all our students - past, present, and future - who strive to learn more or even to become their best selves. It is for every student, community member, and student-athlete who wants to live fully for today and for years to come. (And for those who take our yoga, pilates, pickleball, swimming, soccer, futsal, indoor cycling, and other amazing activity classes at De Anza College!)

Your body and mind are your most important tools. Exercise is a prescription for mental health, physical health, strength, mobility, resilience, and longevity. Physical and mental health, fitness, and sport are among the last true arenas where results are earned through real effort. There is no AI shortcut, no instant button, no app that can replace the time, energy, and consistency required to become your best self. True wellness, both in body and mind, demands dedication, practice, and persistence.

Understanding your own health, fitness, and lifestyle choices empowers you to make decisions that enhance every part of your life. Whether your goals are performing at your best, managing a busy schedule, or simply feeling strong and energized every day, the strategies in this book are here to equip you with guidance. Small, consistent actions, rooted in knowledge and intentional effort, are what transform your life. Embrace the challenge!

We are pretty sure your future self will thank you.

In health and happiness,

Danielle, Rusty, and Cheryl

About the Book

Philosophy and Content

"Fit Happens" is designed as a practical guide for students enrolled in fitness, wellness, and physical activity laboratory courses. The text is grounded in the belief that health and wellness are lifelong pursuits that require knowledge, self-awareness, critical thinking, and active participation. Rather than simply presenting information about exercise and health, the book encourages students to apply course concepts to their own lives through self-assessments, reflection activities, fitness testing, goal setting, and personal wellness planning.

The framework of the text is built around the interconnected concepts of fitness, wellness, and health. While physical fitness is an important component of overall well-being, the text recognizes that health is multidimensional and influenced by physical, psychological, emotional, social, environmental, and behavioral factors. Students are encouraged to view wellness as an active process of making informed choices that support long-term quality of life rather than as a fixed state that can be achieved once and maintained indefinitely. The content emphasizes evidence-based principles that help students understand how lifestyle behaviors influence health outcomes. Topics such as physical activity, exercise programming, cardiorespiratory fitness, muscular fitness, flexibility, nutrition, stress management, sleep, mental health, behavior change, and chronic disease prevention are presented in ways that are both scientifically grounded and personally relevant. Throughout the text, students are asked to connect scientific concepts to their own experiences and health behaviors.

A central philosophy of "Fit Happens" is that lasting health improvements are most likely to occur when students become active participants in their own learning. For this reason, the book incorporates a variety of experiential learning opportunities, including fitness assessments, wellness inventories, activity tracking, goal-setting exercises, and personal reflection. These activities allow students to evaluate their current health behaviors, monitor progress, and develop practical skills that can be applied beyond the classroom.

The content choices reflect a commitment to inclusivity and lifelong physical activity. Rather than focusing solely on athletic performance or competitive sport, the text recognizes that health-enhancing physical activity can take many forms and can be adapted to meet the needs, interests, abilities, and goals of diverse individuals. The ultimate goal is to help students develop the knowledge, confidence, and skills necessary to make informed decisions about their health and wellness throughout their lives.

As an open educational resource, "Fit Happens" is designed to be accessible, adaptable, and student-centered. The text serves not only as a source of information but also as a practical resource that empowers students to take ownership of their health, evaluate wellness-related information critically, and build sustainable habits that support lifelong well-being.

Why Did We Write Fit Happens?

"Fit Happens" was born from a desire to better serve the students of De Anza College. As faculty members in the Department of Physical Education and Athletics, we recognized the need for a resource that reflected both the goals of our curriculum and the unique needs of our students. De Anza College offers a wide variety of physical activity, fitness, wellness, and health-related courses that play an important role in the general education experience and support students pursuing associate and transfer degrees in kinesiology and related fields. We wanted a textbook that would help students connect classroom concepts to their own lives while promoting a deeper understanding of fitness, wellness, and lifelong health.

At De Anza College, we believe in a holistic approach to student success. Academic achievement is important, but so too are the physical, emotional, and social dimensions of well-being. College can be demanding, and students often face significant academic pressures, competing responsibilities, and challenges related to mental health and wellness. For this reason, "Fit Happens" was designed not only to teach the principles of fitness and health but also to encourage students to develop habits and skills that support overall well-being. Throughout the text, we emphasize the interconnected nature of physical activity, mental health, stress management, nutrition, sleep, and lifestyle behaviors, recognizing that each contributes to a healthy and balanced life.

How Did We Write Fit Happens?

The process of creating "Fit Happens" was both rewarding and challenging. In many ways, it reminded us of our own experiences as undergraduate and graduate students spending countless hours researching, writing, revising, and refining academic work. What began as a simple idea quickly became a multi-year project that required us to learn entirely new skills and approaches to textbook development.

As first-time authors in the Open Educational Resources (OER) and Zero Textbook Cost (ZTC) movement, we often found ourselves learning through trial and error. We became the "guinea pigs" as we navigated unfamiliar publishing platforms, explored digital textbook design, and developed a deeper appreciation for accessibility standards and inclusive educational practices. Every chapter required careful consideration of content, organization, readability, and accessibility to ensure that all students could effectively engage with the material. The collaborative nature of the project added both complexity and strength to the process. As three faculty members with different experiences, perspectives, and areas of expertise, we spent many hours discussing content, debating ideas, revising drafts, and striving to create a resource that reflected our shared commitment to student learning. While there were certainly moments of frustration and exhaustion, there were also moments of creativity, discovery, and growth.

One of the most important lessons we learned during this process was the complexity and importance of accessibility. Creating an accessible textbook involves far more than simply providing digital content. Every image requires meaningful alternative text, tables must be structured correctly, headings must follow a logical hierarchy, color choices must be carefully considered, and content must be designed so that it can be effectively navigated and interpreted by a variety of assistive technologies, including screen readers. We quickly discovered that accessibility is not a single task that can be completed at the end of a project; rather, it is an ongoing commitment that must be considered throughout every stage of textbook development.

At De Anza College, we hold ourselves to the highest standards of accessibility because we believe that all students deserve equitable access to educational materials. This commitment challenged us to think differently about how information is presented and how diverse learners engage with content. While the learning curve was often steep, the process deepened our understanding of inclusive education and strengthened our belief that accessibility is not simply a legal requirement; it is a fundamental component of student success and educational equity. As educators, we also viewed this process as an opportunity to model the thoughtful and ethical use of emerging technologies in higher education.

Ultimately, Fit Happens represents more than a textbook. It reflects our belief that high-quality educational resources should be accessible to all students and that fitness, wellness, and health are essential components of a meaningful and successful college experience. We hope that this book not only supports your learning in the classroom but also provides knowledge and tools that will benefit you long after your time at De Anza College.

Terminology Note: Biological Sex and Gender

Throughout this text, the terms **biological sex** and **gender** are used according to their common usage in contemporary health and social science research. **Biological sex** refers to biological characteristics such as chromosomes, reproductive anatomy, and hormone profiles that are typically categorized as male, female, or intersex. **Gender** refers to the social, cultural, psychological, and personal dimensions of identity, roles, and expectations associated with being a man, woman, both, neither, or another gender identity. Although biological sex and gender are related, they are distinct concepts and should not be used interchangeably. Depending on the topic being discussed, researchers in kinesiology may examine biological sex, gender, or both because each can influence physical activity participation, health outcomes, athletic performance, and movement experiences. In exercise physiology and biomechanics research, biological sex is often examined because physiological differences can influence anatomy, metabolism, hormonal responses, and physical performance. In contrast, gender may influence physical activity behaviors, access to sport and exercise opportunities, social expectations, and movement experiences.

Why You Should Adopt This Text

While the cost savings associated with Open Educational Resources are significant, we believe the greatest strength of "Fit Happens" lies in its student-centered design and practical application. The text was written specifically for contemporary college students and emphasizes the knowledge, skills, and behaviors necessary for lifelong health and wellness. Rather than presenting fitness and health concepts as abstract information, "Fit Happens" encourages students to actively engage in self-assessment, reflection, goal setting, and behavior change. The book integrates current evidence-based practices, promotes health literacy, and addresses topics that are increasingly relevant on college campuses, including mental health, stress management, sleep, physical activity, and overall well-being. In addition, its commitment to accessibility, adaptability, and inclusive pedagogy allows

institutions to customize the content to meet the unique needs of their students and programs. Colleges seeking a resource that supports both academic learning and personal development will find "Fit Happens" to be a valuable tool for helping students build the knowledge, confidence, and habits necessary to thrive both inside and outside the classroom.

About the Authors

About the Authors

Team Images	Team Bios
 Danielle Altman	Danielle Altman is the head aquatics coach (men's and women's water polo 2010-2022 and swimming and diving 2010 to the present) and a full-time instructor in the Department of Physical Education and Athletics at De Anza College. Altman also served in the position as Assistant Athletics Director from 2016-2021. She earned her Bachelor of Arts degree from the University of Redlands in 1997, double majoring in International Relations and French. A three-sport athlete, Altman competed in cross country, swimming, and water polo, earning Academic All-American honors in cross country, All-Conference recognition in swimming and water polo, and three-time All-American distinction in water polo. Following her undergraduate studies, Altman initially planned to pursue a career in law. However, her passion for fitness, exercise, and athletics led her to coaching and teaching. She began her coaching career in 1997 as the head coach for the inaugural girls' water polo team at Bear River High School in Grass Valley, California, and also coached both boys' and girls' swim and dive teams. In 1998, Altman was appointed the first women's water polo coach at California State University, San Bernardino. While at CSUSB, she earned a master's degree in Education and Kinesiology and obtained certification as a yoga instructor. She subsequently taught kinesiology courses at both CSU San Bernardino and CSU Fullerton. In 2002, Altman became the head women's water polo coach at the University of California, Santa Barbara, where she guided the program to its highest national ranking in history; fifth in the nation. During her tenure at UCSB, she discovered a deep passion for both teaching and coaching and recognized that the community college environment provided the ideal opportunity to integrate these pursuits. Altman currently resides in Los Gatos, California, with her two children, Xander and Aurora.
 Rusty Johnson	Rusty Johnson's journey has taken him across the country—from North Carolina to California, Nebraska, Alabama, Washington, and Illinois—before settling in the Bay Area to attend Santa Clara University. Growing up in a military family, Rusty moved every few years to a new location in the United States. Throughout each transition, one thing remained constant: being on a soccer team. A former NCAA Division 1 goalkeeper, Johnson competed in the 1999 NCAA National Championship and discovered a lifelong passion for leadership and teaching through sport. After earning his degree in Mechanical Engineering, he returned to Santa Clara as an assistant coach for the men's team, serving for a decade before transitioning to De Anza College as a head coach. He completed a Master of Arts in Kinesiology and Curriculum Development at Fresno Pacific University in 2017 and now serves as a full-time kinesiology instructor and head coach for both the men's and women's soccer programs at De Anza College. Coaching at this level demands so much time and around-the-clock availability that Rusty credits much of his professional success to his assistant coaches and his family's steady support. He lives in Willow Glen, San Jose, with his wife, Meghan, and daughter, Colette.

Team Images	Team Bios
 Cheryl Owiesny	About the Author Cheryl Owiesny is a Kinesiology and Physical Education instructor at De Anza College in Cupertino, California, where she has dedicated more than 25 years to teaching, coaching, and student success. She holds a Master of Arts in Kinesiology from San José State University, a California teaching credential from Notre Dame de Namur University, and a bachelor's degree in Physical Education with an emphasis in coaching and teaching and a minor in health from California State University, Chico. Cheryl's connection to community colleges began as a student-athlete at Foothill College, where she competed in both soccer and track and field. She later transferred to Chico State, where she continued her soccer career and earned the Female Scholar Athlete Scholarship. Following college, she played semi-professional soccer while pursuing a career in education and coaching. While completing her master's degree, Cheryl worked as a substitute teacher serving students in kindergarten through twelfth grade classrooms. Her passion for education and physical activity ultimately led her to a career in higher education, where she has taught a wide range of kinesiology, fitness, wellness, and physical education courses. In addition to her work in the classroom, Cheryl spent nearly three decades as the head women's soccer coach at De Anza College. Under her leadership, the program earned multiple conference championships, regional playoff appearances, national rankings, academic honors, and All-American selections. Her coaching accomplishments include being named California Community College Soccer Coaches Association Coach of the Year and receiving numerous regional and national coaching honors. In 2016, she was selected as a recipient of the California Community College Coaches Association Coaching Achievement Award, an honor bestowed by a committee of coaches' association leaders in recognition of outstanding contributions to coaching and student-athlete development. In 2024, she was inducted into the California Community College Soccer Coaches Association Hall of Fame. Beyond coaching, Cheryl has served in leadership roles at the state and national levels, advocating for community college athletics, student-athlete success, health and wellness initiatives, and opportunities for women in sport. She has contributed to curriculum development, online education, instructional design, and numerous college and statewide committees. Cheryl also holds advanced coaching credentials, including a United Soccer Coaches Premier Diploma, a United States Soccer Federation "A" License, and a USSF Grassroots Instructor License. As an educator, coach, and lifelong learner, Cheryl believes that physical activity has the power to improve health, enhance quality of life, build confidence, and strengthen communities. Through her teaching and writing, she strives to make evidence-based health and fitness information accessible, practical, and meaningful for students from all backgrounds. Cheryl resides in Saratoga, California, with her husband, Chad, and their daughters, Sydney and Bailey. Her experiences as an educator, coach, parent, and lifelong advocate for health and wellness continue to shape her teaching philosophy and commitment to helping students achieve their personal and academic goals.

1: INTRODUCTION TO WELLNESS, FITNESS, AND LIFESTYLE MANAGEMENT

1.1: Lifestyle Evaluation and Behavior Modification (Lab 1.1)

1.2: S.M.A.R.T. Goal Worksheet (Lab 1.2)

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1.1: Lifestyle Evaluation and Behavior Modification (Lab 1.1)

Lab 1.1

Name:

Date:

Instructions:

For each statement below, select the option that best describes your behavior. Think critically about your day-to-day life and be honest about the areas where a behavior change could benefit your daily wellness. Ultimately, you will notice areas that garner attention and have the opportunity to reflect.

Table 1.1.1: Lifestyle Evaluation Worksheet

Exercise and Fitness	Always
Moderate Exercise (20-60 min, 3-5 times per week)	
Strength Exercises at least twice weekly	
Recreational or social physical activities	
Maintaining a healthy body weight	

Nutrition	Always
7+ daily servings of fruits/vegetables	
Limit fats (saturated and trans fats)	
Avoid skipping meals	
Limit salt and sugar	

Tobacco Use	Always
No use of tobacco products	
If used, limit to occasional pipe/cigar use	

Alcohol and Drug Use	Always
Alcohol consumption is limited or avoided	
No alcohol/drugs to cope with stress	
Avoid unsafe alcohol situations (medication/pregnancy)	
Follow medication instructions carefully	

Emotional Health	Always
Enjoy work, studies, or volunteer roles	
Able to relax and express emotions	
Manage stress effectively	
Have a strong support network	

Emotional Health		Always
Engage regularly in hobbies or activities		
Safety		Always
Always wear a seatbelt		
Never drive under the influence		
Follow traffic laws		
Read safety labels/instructions		
Avoid risky behaviors like smoking in bed		
Disease Prevention		Always
Know the signs of major health issues (cancer, stroke, etc.)		
Regular sun protection		
Regular medical screenings and immunizations		
Conduct regular self-exams		
Practice safe sex and abstinence		

Table 1.1.1: Fitness Worksheet by [Rusty Johnson](#) is licensed [CC BY-NC 4.0](#)

Reflection

In reading through the responses above, think about areas that you have scored higher than most sections, as well as sections that you have scored lower than most.

1. **Which sections reflect your strengths?**
2. **Which areas could you improve?**
3. **List two wellness goals for the next month:**

- **Goal #1**

- **Goal #2**

1.2: S.M.A.R.T. Goal Worksheet (Lab 1.2)

Lab 1.2

Name:

Date:

Instructions:

Crafting S.M.A.R.T. Goals is designed to help you identify if what you want to achieve is realistic and determine a deadline. When writing S.M.A.R.T. Goals, use concise language, but include relevant information. These are designed to help you succeed, so be positive when answering the questions.

Goal Measures:

1. Write the goal you have in mind. (Write an initial goal)
2. **Specific:** What do you want to accomplish? Who needs to be included? When do you want to do this? Why is this a goal?
3. **Measurable:** How can you measure your progress to know you have successfully met your goal?
4. **Achievable:** Do you possess the necessary skills to achieve this goal? If not, can you obtain them? What is the motivation for this goal? Is the amount of effort required on par with what the goal will achieve?
5. **Relevant:** Why am I setting this goal now? Is it aligned with the overall objectives?
6. **Time-bound:** What is the deadline, and is it realistic?
7. Rewrite the initial goal as a S.M.A.R.T. goal by reviewing what has been written and crafting a new goal statement based on what the answers to the questions above have revealed.

Table 1.2.1: S.M.A.R.T. Goal Worksheet by [Rusty Johnson](#) is licensed [CC BY-NC 4.0](#)

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2: PRINCIPLES OF PHYSICAL FITNESS

2.1: Barriers to Being Active Quiz (Lab 2.1)

2.2: Activity Log (Lab 2.2)

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2.1: Barriers to Being Active Quiz (Lab 2.1)

Lab 2.1

Name:	Date:
-------	-------

What keeps you from being more active?

Directions: Listed below are reasons that people give to describe why they do not get as much physical activity as they think they should. Read each statement aloud and indicate how likely you are to say each of these statements:

Lab 2.1.1 What keeps you from being more active?

Number	How likely are you to say?	Very likely	Somewhat likely	Somewhat unlikely	Very unlikely
1	My day is so busy now that I don't think I can make the time to include physical activity in my regular schedule.	3	2	1	0
2	None of my family members or friends like to do anything active, so I don't get a chance to exercise.	3	2	1	0
3	I'm just too tired after work to get any exercise.	3	2	1	0
4	I've been thinking about getting more exercise, but I just can't seem to get started.	3	2	1	0
5	I'm getting older so exercise can be risky.	3	2	1	0
6	I don't get enough exercise because I have never learned the skills for any sport.	3	2	1	0
7	I don't have access to jogging trails, swimming pools, bike paths, etc.	3	2	1	0
8	Physical activity takes too much time away from other commitments-time, work, family, etc.	3	2	1	0
9	I'm embarrassed about how I will look when I exercise with others.	3	2	1	0
10	I don't get enough sleep as it is. I couldn't get up early or stay up late to get some exercise.	3	2	1	0
11	It's easier for me to find excuses not to exercise than to go out to do something.	3	2	1	0
12	I know of too many people who have hurt themselves by overdoing it with exercise.	3	2	1	0
13	I really can't see learning a new sport at my age.	3	2	1	0
14	It's just too expensive. You have to take a class or join a club or buy the right equipment.	3	2	1	0
15	My free time during the day is too short to include exercise.	3	2	1	0
16	My usual social activities with family or friends do not include physical activity.	3	2	1	0
17	I'm too tired during the week and I need the weekend to catch up on my rest.	3	2	1	0

Number	How likely are you to say?	Very likely	Somewhat likely	Somewhat unlikely	Very unlikely
18	I want to get more exercise, but I just can't seem to make myself stick to anything.	3	2	1	0
19	I'm afraid I might injure myself or have a heart attack.	3	2	1	0
20	I'm not good enough at any physical activity to make it fun.	3	2	1	0
21	If we had exercise facilities and showers at work, then I would be more likely to exercise.	3	2	1	0

Follow these instructions to score yourself:

1. Enter the scores you circled in the spaces provided below. Put the score for statement #1 on row 1, statement #2 on row 2, and so on. The set of scores for statements 1, 8, and 15 will be on the same row.
2. Add the three scores on each line to get the total for each set.
3. Your barriers to physical activity fall into one or more of seven categories:
 - Lack of time
 - Social influences
 - Lack of energy
 - Lack of willpower
 - Fear of injury
 - Lack of skill
 - Lack of resources
4. A score of 5 or above in any category shows that this is an important barrier for you to overcome.

Lab 2.1.2 Barriers to being active scoresheet.

Statement numbers	Scores for each set	Total for each set	Barrier category
Example enter score for each question	Ex. 3, 0, 1	4	Lack of resources
1, 8, 15			Lack of time
2, 9, 16			Social influence
3, 10, 17			Lack of energy
4, 11, 18			Lack of willpower
5, 12, 19			Fear of injury
6, 13, 20			Lack of skill
7, 14, 21			Lack of resources

Suggestions for Overcoming Physical Activity Challenges

Challenge: Lack of Time

- Find time slots. Pay attention to your daily activities for 1 week. When can you find time to be active at least 30 minutes a day, 5 days a week?
- Add physical activity to your daily routine. For example, walk or ride your bike to work or shopping, organize school activities around physical activity (e.g., scheduling a walk for your child's class), walk the dog, exercise while you watch TV, or park farther away from your destination.

- Make time for physical activity. For example, walk or jog during your lunch hour, or take fitness breaks instead of coffee breaks.

Challenge: Social Influence

- Explain your interest in physical activity to friends and family. Ask them to support your efforts.
- Invite friends and family members to exercise with you. Plan social activities involving exercise.
- Develop new friendships with physically active people. Join a group, such as the YMCA or a hiking club.

Challenge: Lack of Energy

- Schedule physical activity for times in the day or week when you feel most energetic.
- Remind yourself that if you give it a chance, physical activity will increase your energy level; then, try it.

Challenge: Lack of Motivation

- Plan ahead. Make physical activity a regular part of your daily or weekly schedule and write it on your calendar.
- Invite a friend to exercise with you regularly and write it on both your calendars.
- Join an exercise group or class.

Challenge: Fear of Injury

- Learn how to warm up and cool down to prevent injury.
- Learn how to exercise at the right level for your age, fitness level, skill level, and health status.
- Choose activities that are not risky.

Challenge: Lack of Skill

- Choose activities that do not require new skills, such as walking, climbing stairs, or jogging.
- Exercise with friends who are at the same skill level as you are.
- Find a friend who is willing to teach you some new skills.
- Take a class to develop new skills.

Challenge: Lack of Resources

- Choose activities that don't require much in the way of facilities or equipment, such as walking, jogging, or jumping rope.
- Identify inexpensive, convenient resources available in your community (e.g., community education programs, park and recreation programs, or worksite programs).

Challenge: Weather Conditions

- Develop a set of regular activities that you can do even in bad weather (e.g., indoor cycling, aerobic dance, indoor swimming, calisthenics, stair climbing, rope skipping, mall walking, dancing, gym games).
- Look at outdoor activities that depend on weather conditions (e.g., cross-country skiing, outdoor swimming, outdoor tennis) as “bonuses”—extra activities when weather and circumstances permit.

Challenge: Travel

- Put a jump rope in your suitcase and jump rope.
- Walk the halls and climb the stairs in hotels.
- Stay in hotels with swimming pools or physical activity facilities.
- Join the YMCA, YWCA, or a national fitness chain that allows members to use the facilities in other cities.
- Visit the local shopping mall and walk for half an hour or longer.
- Bring an MP3 player or cell phone with your favorite aerobic or physical activity music.

Challenge: Family Obligations

- Trade babysitting time with a friend, neighbor, or family member who also has small children.
- Do physical activities with the kids—go for a walk together, play tag or other running games, or get an aerobic dance or exercise video for kids (there are several available online for free) and exercise together. You can spend time together and still get your physical activity.
- Jump rope, ride a stationary bicycle, or do other stationary or indoor aerobic activity while the kids are playing or sleeping.
- Try to do physical activity when the kids are not around (e.g., during school hours or their nap time).
- Encourage physical activity facilities to provide childcare services.

Alternate Version: Barriers to Being Active

This page can be printed and saved as a PDF. If you prefer a printable PDF, it can be downloaded through the following link.

Taken from the Center for Disease Control and Prevention Road to Health Toolkit [Barrier to Being Active Quiz pdf](#) in the Public Domain.

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2.2: Activity Log (Lab 2.2)

Lab 2.1

Name:

Date:

Use this log to track your minutes of physical activity each day. If you'd like, you can also track more details. about your activity, such as what activity you did, how far you went, how fast you went, how heavy your weights were, how many steps you took, and how many calories you burned.

Lab 2.2.1 Activity Log

Date	Minutes	Activity	Pace: Easy	Pace: Moderate	Pace: Hard	Reflection: Write about your wins and challenges for this week.
Monday						
Tuesday						
Wednesday						
Thursday						
Friday						
Saturday						
Sunday						
Total Minutes						

This page can be printed and filled out.

Attributions

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3: CARDIORESPIRATORY ENDURANCE

Introduction to Cardiorespiratory Endurance Assessments

Assessing cardiorespiratory endurance is an essential step in evaluating overall fitness and establishing a baseline for exercise programming. This component of fitness reflects how efficiently the heart, lungs, and muscles work together during prolonged physical activity. A variety of field-based and practical assessments have been developed to estimate VO_2 max, an important marker of aerobic capacity and cardiovascular health.

Each test included in this section offers a different approach to measuring endurance, with options suitable for a wide range of fitness levels, physical abilities, and preferences. Whether you're an experienced runner, a recreational walker, or someone with joint concerns, there is a test that can help you better understand your cardiorespiratory fitness.

The six assessments in this section include both time-based and distance-based tests, as well as options for land or water. When choosing a test, consider your current fitness level, any physical limitations, the availability of equipment or space, and the purpose of the assessment (e.g., general fitness tracking, training goals, or sports readiness).

Explore the following assessments to determine which one best fits your needs.

Each activity includes step-by-step instructions and scoring guidance to help you accurately assess and interpret your cardiorespiratory fitness level.

[3.1: Cooper 1.5 Mile Run/Walk Assessment \(Lab 3.1\)](#)

[3.2: One-Mile Walk Test \(Rockport Walk Test\) \(Lab 3.2\)](#)

[3.3: 12 Minutes Cooper Run \(Lab 3.3\)](#)

[3.4: 12-Minute Swim Test \(Lab 3.4\)](#)

[3.5: 3-Minute Step Test \(Lab 3.5\)](#)

[3.6: Beep Test \(Lab 3.6\)](#)

3.1: Cooper 1.5 Mile Run/Walk Assessment (Lab 3.1)

Lab 3.1

Name:

Date:

Cooper 1.5 Mile Run/Walk Assessment: What Is It?

To assess cardiorespiratory endurance by measuring the time it takes to complete 1.5 miles. Before doing the test, you may want to practice pacing yourself to avoid going too fast at the start and becoming prematurely fatigued. Allow yourself a day or two to recover from your practice run before taking the test. This test aims to complete the 1.5 miles as fast as you can.

Who Should Use This Test?

Advantages:

- Simple and low-cost
- Requires minimal equipment
- Can be self-administered
- Good indicator of aerobic fitness

Limitations:

- Not suitable for individuals with health risks or joint issues
- Accuracy depends on pacing and motivation
- Environmental factors (weather, terrain) may affect results

What You Need

- Stopwatch or timer
- Measured 1.5-mile course (ideally a regulation track, treadmill, or marked flat path)
- Comfortable running/walking shoes
- Water for after you finish
- Weight in kg.

Optional:

- Heart rate monitor
- GPS tracking device

How to Do the Test

1. Warm-up with 5–10 minutes of light aerobic activity (e.g., walking or dynamic stretching)
2. Ensure you're well-hydrated and not fatigued
3. Begin at the starting line of the measured 1.5-mile course.
4. Start the timer as you begin running or walking.
5. Complete the 1.5 miles as quickly as possible at a consistent pace.
6. Stop the timer upon finishing.
7. (Optional) Take your heart rate immediately after finishing.

8. Cool down after the test by walking or jogging slowly for about five minutes.

What You Need to Record

Record the total time in minutes and seconds.

Results

There are a few ways to calculate your Maximal Oxygen Consumption ($VO_2\text{max}$).

1. Table 3.10.1.1 and Table 3.10.1.2 are based on a percentile by age, gender, and time.
2. Table 3.10.1.3 and Table 3.10.1.4 are based on an estimated $VO_2\text{max}$ calculation. See below for the calculation.
3. How to Determine $VO_2\text{max}$ (Estimate):
 - Use this formula (for adults):
 - $VO_2\text{max} = 88.02 - (0.1656 \times \text{body weight in kg}) - (2.76 \times \text{time in minutes}) + (3.716 \times \text{gender})$
 - Use 1 for males, 0 for females

Use the bottom charts for rating.

Table 3.1.1 Female Percentile Ranks for Cooper 1.5-Mile Run/Walk Percentile. Using the chart below, you can determine your CV fitness category based on your time.

Percentile	90th	80th	70th	60th	50th	40th	30th	20th	10th
Age									
20-29	10:59	11:56	12:51	13:25	14:15	15:05	15:56	17:11	18:39
30-39	11:43	12:53	13:41	14:33	15:14	15:56	16:46	18:18	20:13
40-49	12:25	13:38	14:33	15:17	16:13	17:11	18:26	19:43	21:52
50-59	13:58	15:14	16:26	17:19	18:05	19:10	20:17	21:57	23:55
60-69	15:32	16:46	18:05	18:52	20:08	20:55	22:34	23:55	26:32

Adapted from The Cooper Institute (2009)

The Cooper Institute®. (2009). *Physical fitness assessments and norms for adults and law enforcement*. Dallas, TX: The Cooper Institute. ^[16]

Table 3.1.2 Male Percentile Ranks for Cooper 1.5-Mile Run/Walk Percentile. Using the chart below, you can determine your CV fitness category based on your time.

Percentile	90th	80th	70th	60th	50th	40th	30th	20th	10th
Age									
20-29	9:34	10:08	10:49	11:27	11:58	12:29	13:08	13:58	15:14
30-39	9:52	10:38	11:09	11:49	12:25	12:53	13:48	14:33	15:56
40-49	10:09	11:09	11:52	12:25	13:05	13:50	14:33	15:32	17:04
50-59	11:09	12:08	12:53	13:53	14:33	15:14	16:16	17:30	19:24
60-69	12:10	13:25	14:33	15:20	16:19	17:19	18:39	20:13	23:27

Adapted from The Cooper Institute (2009)

The Cooper Institute®. (2009). *Physical fitness assessments and norms for adults and law enforcement*. Dallas, TX: The Cooper Institute. ^[16]

You can also use your time to calculate your estimated VO₂max!

1. Convert your running time from minutes and seconds to a decimal figure.
 1. **Example:** a time of 14 minutes 25 seconds would be $14 + (25/60)$, or 14.4 minutes
2. Insert your running time into the equation below, where
 - T = running time (in minutes, decimal figure)
 - $VO_{2max} = (483 / \text{Time}) + 3.5$
 - **Example:** a person who completes 1.5 miles in 14.4 minutes would calculate maximal oxygen consumption as follows:
 - $VO_{2max} = (483 / 14.4) + 3.5 = 37\text{m/kg/mm}$
3. Using the chart below, you can determine your CV fitness category based on your calculated VO₂max. (Hint: if the same time for the equation was used as for the above chart, the results should be similar.)

Table 3.1.3 Female Estimated VO₂max (ml.kg.min) Percentile

Percentile	90th	80th	70th	60th	50th	40th	30th	20th	10th
Age									
20-29	46.8	43.9	41.1	39.5	37.8	36.1	34.1	32.3	29.5
30-39	45.3	42.4	39.6	37.7	36.7	34.2	32.4	30.9	28.0
40-49	43.1	39.6	38.1	35.9	34.5	32.8	31.1	29.4	26.6
50-59	38.8	36.7	34.2	32.6	31.4	29.9	28.7	26.8	24.6
60-69	35.9	32.7	31.1	29.7	28.8	27.3	25.9	24.6	23. Adapted from The Cooper Institute (2009)

Table 3.1.4 Male Estimated VO₂max (ml.kg.min) Percentile

Percentile	90th	80th	70th	60th	50th	40th	30th	20th	10th
Age									
20-29	54.0	51.1	47.5	45.6	43.9	41.7	39.9	38.0	34.7
30-39	51.7	48.3	46.0	44.1	42.4	40.7	38.7	36.7	33.8
40-49	49.6	46.4	43.9	42.4	40.1	38.4	36.7	34.8	32.3
50-59	46.8	43.3	41.0	39.0	37.1	35.5	33.8	32.0	29.4
60-69	42.7	39.6	37.4	35.6	33.8	32.3	30.8	28.7	25.6

Adapted from The Cooper Institute (2009)

The Cooper Institute®. (2009). *Physical fitness assessments and norms for adults and law enforcement*. Dallas, TX: The Cooper Institute. ^[16]

Note: The Cooper 1.5-mile walk/run test is just one method of estimating cardiovascular fitness. There are other assessments available if this test is not a safe, practical option.

This page titled [3.1: Cooper 1.5 Mile Run/Walk Assessment \(Lab 3.1\)](#) is shared under a [CC BY 4.0](#) license and was authored, remixed, and/or curated by Danielle Altman, Rusty Johnson, and Cheryl Owiesny.

3.2: One-Mile Walk Test (Rockport Walk Test) (Lab 3.2)

Lab 3.2

Name:

Date:

One-Mile Walk Test: What Is It?

The One-Mile Walk Test (also called the Rockport Walk Test) is a simple way to measure your cardiorespiratory fitness—how well your heart and lungs work when you exercise. You just walk a mile as fast as you can (without running), and your results help estimate your VO_2max , which is a measure of aerobic capacity.

It's easy to do, doesn't need fancy equipment, and is a great starting point if you're new to fitness or just want to track your progress.

Who Should Use This Test?

- Men and women ages 20–69
- Beginners, older adults, or anyone who can't run
- People who want a low-impact test they can repeat later to see progress

What You Need?

Before starting the test, you'll need:

- A stopwatch or timer
- A heart rate monitor (most fitness watches have one), or know how to take your pulse manually
- Comfortable walking shoes and clothing
- A weight scale (lbs)
- A flat 1-mile walking route (such as a track or treadmill)

Tip: On a standard 400-meter track, walk just over 4 laps to complete a mile.

How to Do the Test

1. Warm up for 5–10 minutes with light movement and stretches.
2. Rest for 2–3 minutes.
3. Put on your heart rate monitor (if using one).
4. Start your timer and walk the 1-mile course as fast as you can, without running.
5. Keep one foot on the ground at all times.
6. When you finish, stop the clock and immediately take your heart rate.

What You Need to Record

To calculate your fitness level, write down:

- Your body weight in pounds (W)
- Your age (A)
- Your gender (male = 1, female = 0)
- Your time to complete the mile (in decimal minutes) (T). Convert your walking time from minutes and seconds to a decimal figure. For example, a time of 14 minutes and 45 seconds would be $14 + (45/60)$, or 14.75

- Your heart rate at the end (bpm) (H)

Interpreting Results VO₂ Max Formula

Use this formula to estimate your VO₂ max (a measure of your aerobic capacity):

VO₂max = $132.853 - (0.0769 \times \text{Weight}) - (0.3877 \times \text{Age}) + (6.315 \times \text{Gender}) - (3.2649 \times \text{Time}) - (0.1565 \times \text{Heart Rate})$ = ml/kg/min (maximum oxygen consumption measured in milliliters of oxygen used per kilogram of body weight per minute)

$132.853 - (0.0769 \times \text{Weight}) - (0.3877 \times \text{Age}) + (6.315 \times \text{Gender}) - (3.2649 \times \text{Time}) - (0.1565 \times \text{Heart Rate}) = \text{ml/kg/min}$

For example, if a 30-year-old man weighing 180 lbs completed the one-mile walk test in 12 minutes and 15 seconds and his post-test heart rate was 165 bpm, VO₂max would be calculated as follows:

Converting time to a decimal: $12 + (15/60) = 12.25$

$$132.853 - (0.0769 \times 180) - (0.3877 \times 30) + (6.315 \times 1) - (3.2649 \times 12.25) - (0.1565 \times 165) = \text{ml/kg/min}$$

$$= 132.85 - 13.842 - 11.631 + 6.315 - 39.995 - 25.822 = 47.88 \text{ ml/kg/min}$$

Alternatively, you can use the 1-mile walk-test calculator that can be found at the [Health and Fitness Education](#) website. This website also has VO₂max ratings charts based on gender.

Fun Fact

The One-Mile Walk Test was created in 1986 by researchers looking for an easier way to measure fitness without using a lab or treadmill test. It's submaximal, which means it doesn't push your body to the limit—just brisk walking!

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3.3: 12 Minutes Cooper Run (Lab 3.3)

Lab 3.3

Name:

Date:

Cooper 12 Minute Run: What Is It?

An assessment to test cardiorespiratory endurance by measuring the distance covered in 12 minutes.

Who Should Use This Test?

Advantages:

- Quick and simple
- Requires minimal equipment
- Validated by research
- Suitable for group testing

Limitations:

- Requires maximal effort for accuracy
- Not ideal for individuals with health limitations
- Environmental factors may affect performance
- Motivation and pacing influence results

What You Need

- Stopwatch, time, smartwatch
- Running shoes
- Use a flat and accurately measured surface such as a standard 400-meter outdoor track, treadmill or marked path.

How to Do the Test

- Before taking the test, be sure that you are properly hydrated.
- Choose a time of day when weather conditions are relatively mild.
- Warm up for 5-10 minutes
- Stretch major leg muscle groups
- Use a flat, consistent surface
- Run in lane 1 (the inside lane) the entire time.
- Try to maintain a steady pace throughout the test while covering as much distance as possible.
- Beginners on this test often make the mistake of starting too fast, leading to early exhaustion and a considerable drop in pace for the remainder of the 12 minute run.
- Cool down properly by walking slowly for 5-10 minutes.

What You Need to Record

- Keep track of how many laps you have completed, rounded to the nearest quarter of a lap.
- Measure post-exercise heart rate. (optional)

VO₂max Formula

$VO_{2\max} = (\text{distance in meters} - 504.9) \div 44.73$

Who Should Use This Test?

Advantages:

- Quick and simple
- Requires minimal equipment
- Validated by research
- Suitable for group testing

Limitations:

- Requires maximal effort for accuracy
- Not ideal for individuals with health limitations
- Environmental factors may affect performance
- Motivation and pacing influence results

Interpreting Results

Step 1. Determining Distance Covered

The following chart from the [Cooper Institute](#) will convert the number of laps you completed to the distance in miles covered. Since running tracks today are in meters rather than yards, you need to be aware that 1 lap (400 meters) is just a tiny bit shy of a quarter mile. Therefore, 4 laps on a 400-meter track is actually 0.994 miles.

Step 2. Calculating VO₂max

Using this online calculator from the website [Exercise Prescription on Internet](#), calculate your estimated VO₂max based on the distance in miles that you cover during the 12-Minute Run test. After inputting your gender, age, and distance, the calculator will provide you with a score and a rating (excellent, good, average, fair, poor).

For a more detailed understanding of the history of the 12-Minute run, The Cooper Institute, 50 Years of the 12-Minute Run; [50 Years of the Cooper 12-Minute Run](#)

The Cooper Institute®. (2009). *Physical fitness assessments and norms for adults and law enforcement*. Dallas, TX: The Cooper Institute. ^[16]

3.4: 12-Minute Swim Test (Lab 3.4)

Lab 3.4

Name:

Date:

12-Minute Swim Test: What It Is

A cardiorespiratory endurance test that measures how far you can swim in 12 minutes. It provides an estimate of your aerobic fitness ($VO_2\text{max}$), specifically adapted for individuals more comfortable in water.

Who Should Use This Test

- Individuals who are proficient swimmers
- People with joint issues or those who prefer low-impact exercise
- Lifeguards, swim team members, triathletes, or anyone training in aquatic environments
- Not ideal for non-swimmers or those with water anxiety

What You Need:

- Access to a pool (preferably 25 or 50 meters in length)
- Stopwatch, wall clock, timer set to 12 minutes, or someone to time you.
- Method to track laps (lap counter, swim watch, or assistant)
- Optional: heart rate monitor (waterproof)
- Swim cap, goggles, and proper swim attire
- Prepare yourself by practicing pacing before taking the test to avoid going too fast at the start and becoming prematurely fatigued. Allow 1-2 days of recovery from practice swim.

How to Do the Test:

- Warm up with light swimming for 5–10 minutes.
- Start the timer and begin swimming at a steady, consistent pace.
- Swim continuously for 12 minutes using any stroke (freestyle is most common)
- Count your total distance swum in meters or yards.
- Record your laps at the end of 12 minutes.

What You Need to Record:

- Total distance covered in meters or yards
- Heart rate immediately after the test. (Optional)
- Stroke type used for consistency in retesting

$VO_2\text{max}$ Formula (Estimated):

- Use this formula for $VO_2\text{max}$ estimation in meters:
- $VO_2 \text{ max} = (\text{Distance in meters} - 504.9) \div 44.73$
- Note: This is the same formula used in the Cooper 12-minute run test and provides an estimate for swimming performance.

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3.5: 3-Minute Step Test (Lab 3.5)

Lab 3.5

Name:

Date:

3-Minute Step Test: What Is It?

A submaximal cardiorespiratory endurance test that measures how quickly your heart rate recovers after stepping up and down a 12-inch platform at a fixed cadence for 3 minutes.

Who Should Use This Test?

- Individuals with moderate to good fitness
- Those who prefer a low-cost, equipment-light method
- General population, especially beginners or those in fitness/wellness courses
- Not recommended for individuals with knee or balance issues

What You Need

- A 12-inch (30.5 cm) step or bench
- Stopwatch or timer (set to 3 minutes)
- Metronome set to 96 beats per minute (BPM) — use a metronome app or video
- Heart rate monitor or the ability to manually check pulse
- (Optional) Partner to assist with timing and heart rate check

How to Do the Test

- Practice stepping up onto and down from the step before you take the test. Each step has 4 beats: up-up-down-down.
- Warm up before. Do some walking or easy jogging.
- Set the metronome to 96 BPM and start your timer for 3 minutes.
- Step up and down in time with the metronome: Up-Up, Down-Down (one full cycle = 4 beats).
- Use a tap, step method to alternate your lead leg and avoid muscle imbalance.
- Continue the stepping rhythm without stopping until the timer ends.

What You Need to Record

- Recovery Heart rate-(beats per minute) for 1 full minute immediately after completing the test
- Time of recovery (if applicable in your version of scoring)

VO₂max Formula (YMCA Version for Men and Women):

To estimate VO₂max using a 1-minute recovery heart rate:

Men:

$$VO_2\text{max} = 111.33 - (0.42 \times \text{heart rate in bpm})$$

Women:

$$VO_2\text{max} = 65.81 - (0.1847 \times \text{heart rate in bpm})$$

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3.6: Beep Test (Lab 3.6)

Lab 3.6

Name:

Date:

Beep Test (20-Meter Shuttle Run Test): What Is It?

The Beep Test is a progressive aerobic endurance test that measures cardiovascular fitness and estimates VO_2 max. Participants run back and forth between two points set 20 meters apart, staying in sync with timed audio beeps. As the test progresses, the time between beeps shortens, requiring an increasingly faster pace. The goal is to continue running and reach each line before the beep for as long as possible.

Who Should Use This Test?

- Athletes and students in team sports (e.g., soccer, basketball, rugby)
- Military, police, or fire recruits for fitness screening
- PE programs (like the FitnessGram PACER test)
- Not recommended for those with cardiovascular or joint issues due to high intensity and impact

What You Need:

- A flat 20-meter running course, ie, track, open field, or gymnasium
- Cones to mark the 20-meter distance.
- Beep test audio recording (available as apps or downloadable tracks) (widely available for free on the internet).
- Speaker to play the audio loudly and clearly
- Stopwatch (optional, as the audio provides timing)
- Score sheet or assistant to track level and shuttles

How to Do the Test:

- Set up a flat 20-meter course with clear start and end points.
- Start the audio recording and begin running when the first beep sounds.
- Reach the opposite line before the next beep.
- Wait in line if you arrive early, and run again when the next beep sounds. (single beep end of shuttle, double beep start shuttle, triple beep next level)
- The time between beeps gets shorter each minute, increasing the pace.
- The test ends when the participant can no longer keep up (misses two beeps in a row).

What You Need to Record:

- Level and number of shuttles (laps) completed
- Optional: estimated VO_2 max from a score chart or formula

VO_2 Max Formula (Estimate):

One commonly used estimate based on the final level and the shuttle is:

$$VO_2\text{max (ml/kg/min)} = 3.46 \times (\text{level reached}) + 14.4$$

This page titled [3.6: Beep Test \(Lab 3.6\)](#) is shared under a [CC BY 4.0](#) license and was authored, remixed, and/or curated by Danielle Altman, Rusty Johnson, and Cheryl Owiesny.

4: MUSCULAR STRENGTH AND ENDURANCE

- 4.1: Assessing Functional Strength
- 4.2: Assessing Muscle Strength
- 4.3: Assessing Muscular Endurance
- 4.4: Creating a Program

4.1: Assessing Functional Strength

Lab 4.1

Name: _____

Date: _____

Functional Leg Strength Tests

The following tests assess functional leg strength using squats. Most people do squats improperly, increasing their risk of knee and back pain. Before you add weight-bearing squats to your weight training program, you should determine your functional leg strength, check your ability to squat properly, and give yourself a chance to master squatting movements. The following leg strength tests will help you in each of these areas (Kerksick et al, 2017). ^[12]

These tests are progressively more difficult, so do not move on to the next test until you have scored at least a 3 on the current test. On each test, give yourself a rating of 0, 1, 3, or 5, as described in the instructions that follow the last test.

Chair Squat

The chair squat is the first functional leg strength test to attempt.

Instructions

- Sit up straight in a chair with your back resting against the backrest and your arms at your sides. Your feet should be placed more than shoulder-width apart so that you can get them under your body.
- Begin the motion of rising out of the chair by flexing (bending) at the hips, not the back. Then squat up using a hip hinge movement (no spine movement). Stand without rocking forward, bending your back, or using external support, and keep your head in a neutral position.
- Return to the sitting position while maintaining a straight back and keeping your weight centered over your feet. Your thighs should abduct (spread) as you sit back in the chair. Use your rear hip and thigh muscles as much as possible as you sit.
- Do five repetitions.

Your rating: _____

Unweighted Squat

The unweighted squat is the second functional leg strength test to attempt.

Instructions

- Stand with your feet placed slightly more than shoulder-width apart, toes pointed out slightly, hands on your hips or across your chest, head neutral, and back straight. Center your weight over your arches or slightly behind.
- Squat down, keeping your weight centered over your arches and actively flexing (bending) your hips until your legs break parallel. During the movement, keep your back straight, shoulders back, and chest out, and let your thighs part to the side so that you are squatting between your legs.
- Push back up to the starting position, hinging at the hips and not with the spine, maximizing a straight back and neutral head position.
- Do five repetitions.

Your rating: _____

Single-Leg Lunge-Squat with Rear-Foot Support

The single-leg lunge squat with rear foot support is the third functional leg strength test to attempt.

Instructions

- Stand about 3 feet in front of a bench (with your back to the bench).
- Place the instep of your left foot on the bench, and put most of your weight on your right leg (your left leg should be bent), with your hands at your sides.
- Squat on your right leg until your thigh is parallel with the floor. Keep your back straight, chest up, shoulders back, and head neutral.
- Return to the starting position. Do three repetitions for each leg.

Your rating: _____

Rating Your Functional Leg Strength Test Results

- **5 Points:**
Performed the exercise properly with good back and thigh position, weight centered over the middle or rear of the foot, chest out, and shoulders back; good use of hip muscles on the way down and on the way up, with head in a neutral position throughout the movement; maintained good form during all repetitions; abducted (spread) the thighs on the way down during chair squats and double-leg squats; for single-leg exercises, showed good strength on both sides; for single-leg lunge-squat with rear-foot support, maintained a straight back, and knees stayed behind toes.
- **3 Points:**
Weight was forward on the toes, with some rounding of the back; used thigh muscles excessively, with little use of hip muscles; head and chest were too far forward; showed little abduction of the thighs during double-leg squats; when going down for single-leg exercises, one side was stronger than the other; form deteriorated with repetitions; for single-leg lunge-squat with rear-foot support and single-leg squat from a bench, could not reach parallel (thigh parallel with floor).
- **1 Point:**
Had difficulty performing the movement, rocking forward and rounding back badly; used thigh muscles excessively, with little use of hip muscles on the way up or on the way down; chest and head were forward; on un-weighted squats, had difficulty reaching parallel; and showed little abduction of the thighs on single-leg exercises, one leg was markedly stronger than the other; could not perform multiple repetitions.
- **0 Points:**
Could not perform the exercise.

4.2: Assessing Muscle Strength

Lab 4.2

Name:

Date:

Assessing Muscle Strength with 1-RM

This lab includes one-repetition maximum (1-RM) testing for both upper and lower body muscular strength. This is the standard for assessing individual strength, as it measures the greatest amount of resistance that can be moved through a full range of motion in good form. This is the most accurate method for testing strength.

Caution

- Any individual should not use the 1RM test without strength-training experience. There are other tests for individuals who are beginning a strength training program to calculate accurate resistance.

Upper Body Strength: Bench Press

The bench press is the standard exercise for calculating upper-body strength.



Figure 4.2.1: Choose a weight that allows for proper technique throughout each repetition, and always use a spotter to ensure safety if muscle fatigue occurs. ([A person lifting weights; Michael De Moya](#) via [Unsplash](#))



Figure 4.2.2: For individuals who are not yet prepared for free weights, cable machines can be used to replicate the bench press movement. (CC BY-SA 2.0; Tyler Read via Wikimedia Commons)

Equipment

- Bench-press machine or a flat bench with barbell, weight plates, and collars
- A spotter
- Weight Scale (to measure body weight)

Preparation

Perform a general warm-up to raise your heart rate. Warm-up on the bench press by performing 1 set of 10 repetitions using a light weight.

- Start on the bench with your feet flat and avoid arching your back.
- If your feet do not reach the floor without arching your back, then place your feet on the bench.
- Grasp the bar with your hands shoulder-width apart, with your palms upward. The bar or free weights should be centered over the middle of your chest.
- Fully extend your arms, without fully locking the elbow joint.
- Lower the bar or weights slowly to your chest, then press them in the same straight line back to the starting position.
- Avoid holding your breath or letting the bar or weights touch your chest.

Instructions for the 1-RM Test

- Start with 50-70% of the amount of weight you think you can lift.
- Lift that amount of resistance with good form one time.
- Increase the weight with each attempt, resting 3-5 minutes between each attempt.
- If you lifted the weight easily, add 20 or more pounds; if you are close to your 1-RM, add smaller amounts of resistance (about 5 pounds).
- The goal is to reach your 1-RM in 4-5 attempts.
- Your 1-RM is the final amount of weight you lifted with good form.

Bench Press 1-RM: _____

To estimate 1-RM from multiple repetitions

Choose a weight that is an amount you think you can lift approximately 10 times.

Using correct form, perform as many repetitions as you can.

Estimate your 1-RM with the Brzycki formula (Aragon, 2021). ^[3]

Bench Press 1-RM = (Resistance: _____lbs) ÷ 1.0278 - (0.0278 X repetitions completed: _____)

Results

Divide your 1-RM score by your body weight:

1-RM _____lb ÷ body weight _____lb = _____ bench-press weight ratio

Find your rating for your bench press in Table 4.2.1 for biological males and in Table 4.2.2 for biological females.

Rating: _____

Table 4.2.1: Bench-Press Weight Ratio Ratings for Biological Males

Age	Superior	Excellent	Good	Fair	Poor
< 20	> 1.76	1.34 – 1.37	1.19 – 1.29	1.06 – 1.18	< 1.01
20-29	> 1.63	1.32 – 1.48	1.14 – 1.26	0.99 – 1.10	< 0.96
30-39	> 1.35	1.12 – 1.24	0.98 – 1.08	0.88 – 0.96	< 0.86
40-49	> 1.20	1.00 – 1.10	0.88 – 0.96	0.80 – 0.86	< 0.78
50-59	> 1.05	0.90 – 0.97	0.80 – 0.87	0.71 – 0.77	< 0.70
60+	> 0.94	0.82 – 0.89	0.72 – 0.79	0.66 – 0.70	< 0.65

Table 4.2.2: Bench-Press Weight Ratio Ratings for Biological Females

Age	Superior	Excellent	Good	Fair	Poor
< 20	> 0.88	0.77 – 0.83	0.65 – 0.76	0.58 – 0.64	< 0.57
20-29	> 1.01	0.80 – 0.90	0.70 – 0.77	0.59 – 0.68	< 0.58
30-39	> 0.82	0.70 – 0.76	0.60 – 0.65	0.53 – 0.58	< 0.52
40-49	> 0.77	0.62 – 0.71	0.54 – 0.60	0.50 – 0.53	< 0.48
50-59	> 0.68	0.55 – 0.61	0.48 – 0.53	0.44 – 0.47	< 0.43
60+	> 0.72	0.54 – 0.64	0.47 – 0.53	0.43 – 0.46	< 0.41

According to the Cooper Institute for Aerobic Research, Table 4.2.1 and Table 4.2.2 indicate the ratings of muscular strength in biological males and females based on the amount of weight lifted once with proper form, the bench press 1-RM (Chen et al, 2022). ^[6] In terms of percentiles, here are what the ratings indicate regarding individual strength:

- Superior = over the 80th percentile
- Excellent = between 60th and 80th percentiles
- Good = between 40th and 60th percentiles
- Fair = between 20th and 40th percentiles
- Poor = below the 20th percentile

Lower Body Strength: Leg Press

The leg press is the standard exercise for calculating lower-body muscular strength.



Figure 4.2.3: A woman using a leg press machine with heavy weights. Her feet are shoulder-width apart, and her back is straight. (CC BY-SA 3.0 via [Wikimedia Commons](#))

Equipment

- Leg-Press Machine
- Weight Scale (to measure body weight)

Preparation

Perform a general warm-up to raise your heart rate. Warm-up on the leg press machine by performing 1 set of 10 repetitions using a light weight.

- Sit or lie on the seat or bench of the machine.
- Adjust it so that your head, back, and buttocks are against the pads and your hands can grasp the panels.
- Your feet should be about shoulder-width apart, and your knees comfortably bent and in line with your feet.
- Keep your feet flat on the footplate and push to straighten with your legs, move through the full range of motion, but avoid locking your knees.
- Return to the starting position by slowly lowering the weight with control.
- Keep your head and back in a steady position.
- Each repetition should take 4-5 seconds.

Instructions

- Start with 50-70% of the amount of weight you think you can press.
- Press that amount of resistance with good form one time.
- Increase the weight with each attempt, resting 3-5 minutes between each attempt.
- If you lifted the weight easily, add 20 or more pounds; if you are close to your 1-RM, add smaller amounts of resistance (about 5 pounds).
- The goal is to reach your 1-RM in 4-5 attempts.
- Your 1-RM is the final amount of weight you lifted with good form.

Leg Press Press 1-RM: _____

To estimate 1-RM from multiple repetitions

Choose a weight that is an amount you think you can lift approximately 10 times.

Using correct form, perform as many repetitions as you can.

Estimate your 1-RM with the Brzycki formula^[3]:

Leg Press 1-RM = (Resistance: _____ lbs) ÷ 1.0278 - (0.0278 x repetitions completed _____)

Results

Divide your 1-RM score by your body weight:

Leg Press 1-RM _____ lb ÷ body weight _____ lb = _____ leg-press weight ratio

Find your rating for your bench press in Table 4.2.3 for biological males and in Table 4.2.4 for biological females.

Rating: _____

Table 4.2.3: Leg-Press Weight-Ratio Ratings for Biological Males

Age (Years)	Well Above Average	Above Average	Average	Below Average	Well Below Average
20-29	> 2.12	1.97 – 2.12	1.83 – 1.96	1.63 – 1.82	< 1.63
30-39	> 1.92	1.77 – 1.92	1.65 – 1.76	1.52 – 1.64	< 1.52
40-49	> 1.81	1.68 – 1.81	1.57 – 1.67	1.44 – 1.56	< 1.44
50-59	> 1.70	1.58 – 1.70	1.46 – 1.57	1.32 – 1.45	< 1.32
60+	> 1.61	1.49 – 1.61	1.38 – 1.48	1.25 – 1.37	< 1.25

Table 4.2.4: Leg-Press Weight-Ratio Ratings for Biological Females

Age (Years)	Well Above Average	Above Average	Average	Below Average	Well Below Average
20-29	> 1.67	1.50 – 1.67	1.37 – 1.49	1.22 – 1.36	< 1.22
30-39	> 1.46	1.33 – 1.46	1.21 – 1.32	1.09 – 1.20	< 1.09
40-49	> 1.36	1.23 – 1.36	1.13 – 1.22	1.02 – 1.12	< 1.02
50-59	> 1.24	1.10 – 1.24	0.99 – 1.09	0.88 – 0.98	< 0.88
60+	> 1.17	1.04 – 1.17	0.93 – 1.03	0.85 – 0.92	< 0.85

According to the Cooper Institute for Aerobic Research, Table 4.2.1 and Table 4.2.2 indicate the ratings of muscular strength in biological males and females. (Chen et al, 2022).^[6] In terms of percentiles, here are what the ratings indicate in regarding individual strength:

- Well Above Average = over the 80th percentile
- Above Average = between 60th and 80th percentiles
- Average = between 40th and 60th percentiles
- Below Average = between 20th and 40th percentiles
- Well Below Average = below the 20th percentile

Summary of Results

Fill in the scores and ratings for the tests you performed in Table 4.2.5.

Summary of Results for 1-RM Testing

Test	Actual 1-RM	Estimated 1-RM	Rating of Ratio
Bench Press			

Test	Actual 1-RM	Estimated 1-RM	Rating of Ratio
Leg press			

Table 4.2.5: Summary of Results by [Danielle Altman](#) is licensed [CC BY-NC 4.0](#)

Reflecting on Your Results

Answer the following questions to be able to understand better your awareness of your current muscular strength levels.

1. Are you surprised by your test results and ratings?
2. Did your test results match how much muscle strength you have in your upper-body and lower-body?

Taking Action

Muscular strength tends to be reflection of training. If your scores were lower than expected, you likely want to get stronger by beginning a new program or making changes to your existing muscular strength/endurance program. If you scored well, then you may opt to keep your regimen the same to maintain your level of fitness. You might also want to add to your routine to promote strength gains with additional exercises or increased weight.

Your next steps include setting S.M.A.R.T. goals for improvement and creating a workout plan to achieve them.

1. Use [Lab 4.11.4](#) "Creating a Program" to describe your goals and the specific steps you will take to improve your muscular strength.
2. Repeat these 1-RM tests every 3-4 weeks to measure your progress and improvements.

Question

- What effect did your plan have on your muscular strength?
 - Did your test scores improve?
 - Do you feel stronger?

4.3: Assessing Muscular Endurance

Lab 4.3

Name: _____

Date: _____

Core and Upper-Body Muscular Endurance

The 60-Second Sit-Up Test

This assessment gauges your core muscle endurance.

For best results, do not do any strenuous weight training within 48 hours of any test.

Equipment

- Stopwatch or electronic timer
- Partner

Warning

- Do not take this test if you suffer from low-back pain.

Instructions

To prepare, try a few sit-ups to get used to the proper technique and warm up your abdominal muscles.

1. Lie flat on your back on the floor with your knees bent, feet flat on the floor, and your fingers interlocked behind your neck and your elbows wide. Your partner should hold your ankles firmly so that your feet stay on the floor as you do the sit-ups.
2. When your partner signals you to begin, raise your head and chest off the floor until your chest touches your knees or thighs, keeping your elbows wide, then return to the starting position. Keep your neck neutral. Do not force your neck forward, and stop if you feel any pain.
3. Perform as many sit-ups as you can in 60 seconds.

Number of sit-ups: _____

Rate Your Results

Your score is the number of sit-ups you complete. See Table 4.3.1 or Table 4.3.2 to rate your results.

Rating: _____

Sit-Up Test Ratings for Biological Males

Age	Very Poor	Poor	Fair	Good	Excellent	Superior
Under 20	Less than 36	36 to 40	41 to 46	47 to 50	51 to 61	More than 61
20-29	Less than 33	33 to 37	38 to 41	42 to 46	47 to 54	More than 54
30-39	Less than 30	30 to 34	35 to 38	39 to 42	43 to 50	More than 50

Age	Very Poor	Poor	Fair	Good	Excellent	Superior
40-49	Less than 24	24 to 28	29 to 33	34 to 38	39 to 46	More than 46
50-59	Less than 19	19 to 23	24 to 27	28 to 34	35 to 42	More than 42
60 and over	Less than 15	15 to 18	19 to 21	22 to 29	30 to 38	More than 28

Table 4.3.1: This table depicts the various ratings for the number of sit-ups performed by men at various age ranges. [CC BY-NC 4.0](#) by Georgia Hylands

Sit-Up Test Ratings for Biological Females

Age	Very Poor	Poor	Fair	Good	Excellent	Superior
Under 20	Less than 28	28 to 31	32 to 35	36 to 45	46 to 54	More than 54
20-29	Less than 24	24 to 31	32 to 37	38 to 43	44 to 50	More than 50
30-39	Less than 20	20 to 23	24 to 28	29 to 34	35 to 41	More than 41
40-49	Less than 14	14 to 19	20 to 23	24 to 28	29 to 37	More than 37
50-59	Less than 10	10 to 13	14 to 19	20 to 23	24 to 29	More than 29
60 and over	Less than 3	3 to 5	6 to 10	11 to 16	17 to 27	More than 27

Table 4.3.2: This table depicts the various ratings for the number of sit-ups performed by biological females at various age ranges. [CC BY-NC 4.0](#) via Georgia Hylands

Upper-Body Endurance Assessment

For best results, do not do any strenuous weight training within 48 hours of any test.

The Push-Up Test



Figure 4.3.1: Proper push-up technique involves maintaining a straight body line from head to heels, engaging the core, lowering the chest with elbows at about 30–45° from the body, and pressing back up with control. (CC BY-SA 4.0; Frank C. Müller via Wikimedia Commons)

Equipment

- Mat or towel (optional)

In this test, participants perform either standard push-ups or modified push-ups, the latter involving knee support. The ratings for this assessment were developed by The Cooper Institute, with men performing standard push-ups and women performing the modified version. Biologically, males generally possess greater upper-body strength than females; the modified technique accounts for this difference by reducing the upper-body strength required in a muscular endurance test. As a result, to ensure an accurate evaluation of upper-body endurance, men are expected to perform standard push-ups, while women are expected to perform modified push-ups. However, when push-ups are used as part of a strength-training program, individuals should select the technique that best supports their progress in strength and endurance, regardless of gender.

Instructions

1. For push-ups: Start in the push-up position with your body supported by your hands and feet.
2. For the modified push-ups: Start in the modified push-up position with your body supported by your hand and knees. For both positions, your arms and your back should be straight, and your fingers pointed forward.
3. Lower your chest to the floor with your back straight, and then return to the starting position.
4. Perform as many push-ups as you can without stopping.

Number of push-ups: _____

Number of modified push-ups: _____

Rating Your Push-Up Test Result

Your score is the number of completed push-ups or modified push-ups. Refer to the Table 4.3.3 or Table 4.3.4 for your pushup ratings and to score your upper-body endurance.

Rating: _____

Push-Up Test Ratings for Biological Males

Age	Very Poor	Poor	Fair	Good	Excellent	Superior
18 to 29	Less than 22	22 to 28	29 to 36	37 to 46	47 to 61	More than 61
30 to 39	Less than 17	17 to 23	24 to 29	30 to 38	39 to 51	More than 51
40 to 49	Less than 11	11 to 17	18 to 23	24 to 29	30 to 39	More than 39
50 to 59	Less than 9	9 to 12	13 to 18	19 to 24	25 to 38	More than 38
60 and over	Less than 6	6 to 9	10 to 17	18 to 22	23 to 27	More than 27

Table 4.3.3: This table depicts the various ratings for the number of sit-ups performed by biological females at various age ranges. [CC BY-NC 4.0](#) via [Georgia Hylands](#)

Push-Up Test Ratings for Biological Females

Age	Very Poor	Poor	Fair	Good	Excellent	Superior
18 to 29	Less than 17	17 to 22	23 to 29	30 to 25	36 to 44	More than 44
30 to 39	Less than 11	11 to 18	19 to 23	24 to 30	31 to 38	More than 38
40 to 49	Less than 6	6 to 12	13 to 17	18 to 23	24 to 32	More than 32
50 to 59	Less than 4	4 to 10	11 to 15	16 to 20	21 to 27	More than 27
60 and over	Less than 2	2 to 4	5 to 11	12 to 14	15 to 19	More than 19

Table 4.3.4: This table depicts the various ratings for the number of sit-ups performed by biological females at various age ranges. [CC BY-NC 4.0](#) via [Georgia Hylands](#)

Lower Body Endurance Test

For best results, do not do any strenuous weight training within 48 hours of any test.

The Squat Endurance Test



Figure 4.3.2: A person performing a bodyweight squat in the lowered position, with thighs parallel to the floor. This person maintains a straight posture, engages their legs, and follows proper squat mechanics. (A woman squatting on the floor in a gym; Sunday II Sunday via Unsplash)

Instructions

1. Stand with your feet placed slightly more than shoulder width apart, toes pointed out slightly, hands on your hips or across your chest, head neutral, and back straight. Center your weight over your arches or slightly behind.
2. Squat down, keeping your weight centered over your arches, until your thighs are parallel with the floor. Push back up to the starting position, maintaining a straight back and neutral head position.
3. Perform as many squats as you can without stopping.

Number of squats: _____

Rating Your Squat Endurance Test Results

Your score is the number of completed squats. Refer to the Table 4.3.5 or Table 4.3.6 for your pushup ratings and to score your upper-body endurance.

Rating: _____

Squat Endurance Test Ratings for Biological Males

Age	Very Poor	Poor	Below Average	Average	Above Average	Good	Excellent
18 to 25	Less than 25	25 to 30	31 to 34	35 to 38	39 to 43	44 to 49	More than 49
26 to 35	Less than 22	22 to 28	29 to 30	31 to 34	35 to 39	40 to 45	More than 45
36 to 45	Less than 17	17 to 22	23 to 26	27 to 29	30 to 34	35 to 41	More than 41
46 to 55	Less than 13	13 to 17	18 to 21	22 to 24	25 to 28	29 to 35	More than 35
56 to 65	Less than 9	9 to 12	13 to 16	17 to 20	21 to 24	25 to 31	More than 31
65 and older	Less than 7	7 to 10	11 to 14	15 to 18	19 to 21	22 to 28	More than 28

Table 4.3.5: This table depicts the various ratings for the number of sit-ups performed by biological females at various age ranges. [CC BY-NC 4.0](#) via [Georgia Hylands](#)

Squat Endurance Test Ratings for Biological Females

Age	Very Poor	Poor	Below Average	Average	Above Average	Good	Excellent
18 to 25	Less than 18	18 to 24	25 to 28	29 to 32	39 to 43	44 to 49	More than 49
26 to 35	Less than 20	20 to 22	23 to 24	25 to 28	29 to 32	33 to 39	More than 39
36 to 45	Less than 7	7 to 14	15 to 18	19 to 22	23 to 26	27 to 33	More than 33
46 to 55	Less than 5	5 to 9	10 to 13	14 to 17	18 to 21	22 to 27	More than 27
56 to 65	Less than 3	3 to 6	7 to 9	10 to 12	13 to 17	18 to 24	More than 24
65 and older	Less than 2	2 to 4	5 to 10	11 to 13	14 to 16	17 to 23	More than 23

Table 4.3.6: This table depicts the various ratings for the number of sit-ups performed by biological females at various age ranges. [\(CC BY-NC 4.0](#) via [Georgia Hylands](#))

Summary of Results

Use Table 4.3.7: to record all of your results.

Rating Table of Your Muscle Fitness Assessments

Test	Number Performed	Rating
Functional Leg Strength Test (one of the three)		
Sit-Up Test		
Push-Up Test		
Squat Endurance Test		

Table 4.3.7: (Table of summary results by [Danielle Altman](#) is licensed [CC BY-NC 4.0](#))

Reflecting on Your Results

Answer the following questions to be able to understand better your awareness of your current muscular strength and endurance levels.

1. Are you at all surprised by your rating for muscular endurance?
2. What factors, if any, influenced your ability to perform these assessments?
3. Are you satisfied with your current level of muscular strength as evidenced in your daily life? For example, are you happy with your ability to lift objects, climb stairs, and engage in sports and recreational activities?

Taking Action

Your next steps include setting S.M.A.R.T. goals for improvement and creating a workout plan to achieve them.

1. Use [Lab 4.11.4](#) "Creating a Program" to describe your goals and the specific steps you will take to improve your muscular strength.
2. Repeat these endurance tests every 3-4 weeks to measure improvements.

Question

- What effect did your plan have on your muscular endurance?
 - Did your test scores improve?
 - Do you feel stronger?

4.4: Creating a Program

Lab 4.4

Name:

Date:

Creating a Muscular Strength and Endurance Program

Instructions

When starting any part of a fitness program, it is important to begin by setting goals.

Set S.M.A.R.T. Goals: Specific, Measurable, Attainable, Realistic, Time-Bound

Examples:

- Number of workouts per week
- Amount of weight or repetitions (based on your own assessments)

Set S.M.A.R.T. Goals

Current Status	Goal	Target Date	Notes (Rewards)

Table 4.4.1: A table to set up S.M.A.R.T. goals. (Danielle Altman is licensed CC BY-NC 4.0)

Apply the FITT Principle

- Frequency: 2-3 days per week, resting at least 48 hours in between workouts (or muscle groups)
- Intensity: Select resistance that allows for 8-12 repetitions of each exercise to be performed to fatigue with good technique. This is usually 60-80% of 1-RM
- Time: 2-4 sets of 8-12 repetitions of each exercise, or 30-minutes per session.
- Type: Perform exercises to train each major muscle group.

Apply the FITT Principle

Muscle Group	Exercise	Starting Resistance	Starting Sets	Starting Reps
Chest				
Shoulders				
Back				
Core				
Quadriceps				
Hamstrings				
Lower Legs				

Muscle Group	Exercise	Starting Resistance	Starting Sets	Starting Reps
Arms: Biceps				
Arms: Triceps				
Additional Exercises:				

Table 4.4.2: A table to set up a strength and resistance training program for beginners using the FITT Principle. (Danielle Altman is licensed CC BY-NC 4.0)

Results

Track progress using a strength-training log, such as the sample in Table 4.4.3: Strength-Training Log.

Strength Training Log

A strength training log can help track progress. Use this sample strength-training log, or create one yourself. You will want to log the date of your workout, the amount of weight you use for each set, and the number of reps. If you are using a resistance band or body weight, you can also make a note of that instead of the amount of weight.

Table 4.4.3: Strength Training Log

Date	Exercise	Set 1		Set 2		Set 3		Set 4		Set 5	
		Weight	Reps	Weight	Reps	Weight	Reps	Weight	Reps	Weight	Reps

Table 4.4.3: A sample strength training log by Danielle Altman is licensed CC BY-NC 4.0

5: FLEXIBILITY, MOBILITY, AND LOW-BACK WELLNESS

5.1: Assessing Flexibility

5.2: Creating a Program

5.3: Evaluating Posture

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5.1: Assessing Flexibility

Lab 5.1

Name:

Date:

Flexibility Assessments

Before beginning a Flexibility program, it is important to assess your flexibility. Completing all of the tests is one of the best ways to assess your overall flexibility; however, any one or more of the tests will give you an excellent starting point for your flexibility goals.

Flexibility tests include:

- Sit-and-reach test (flexibility of the lower back and hamstrings)
- Shoulder Flexibility Test
- Straight Leg Raise (SLR) Test (hamstring flexibility)
- Trunk Rotation Test (core and spinal flexibility)

Sit-and-Reach Test

This test gauges the flexibility of your lower back and hamstrings (back of the legs).



Figure 5.1.1: Checking hamstring flexibility with a sit and reach test. (CC BY 2.0; A Healthier Michigan via Wikimedia Commons)

Equipment

- A sit-and-reach box with the foot-line set at 15 centimeters (cm).
- To create your own, you need a firm box and a metric ruler. Set the ruler so the 15-cm mark is aligned with the end of the box. NOTE: If you can reach past your feet, your score will be higher than 15 cm; if you can't reach past your feet, your score will be less than 15 cm.
- A partner to check your measurements

Instructions

1. To prepare, warm up for 5-10 minutes with a low-intensity aerobic activity.
2. Do some gentle stretching of your hamstrings and your lower back.
3. Remove your shoes and sit with your feet flat against the sit-and-reach box or the firm box. Your feet should be at the 15-cm mark of the metric ruler or measuring device.
4. Keep the inner edges of your feet within 2 cm of the ruler or measuring device.
5. Overlap your fingertips, but do not lead with one hand.
6. With your hands parallel and in contact with the measuring portion of the sit-and-reach box or the ruler, slowly reach forward as far as possible.
7. Keep your knees extended, but avoid locking them or pressing them down.
8. For best results, exhale and drop your head between your arms as you reach forward. (Avoid holding your breath!)
9. Once you've reached as far as you can, hold the position for 2 seconds. Your partner will take note of the measurement.
10. Repeat the test one more time.

Results

Your score is the furthest your fingertips reached in centimeters. Please note that if your sit-and-reach box has a different foot-line (aka zero point), adjust your score accordingly. For example, if the foot-line of your score is 26, subtract 11 cm from your score.

Trial 1: _____ cm

Trial 2: _____ cm

Best Trial: _____ cm

Rate Your Results

Find the rating that corresponds to your results in Table 5.1.1 or Table 5.1.2.

Rating: _____

Table 5.1.1: Ratings for the Sit-and-Reach Test in Centimeters for Biological Adult Males

Age	Poor	Fair	Good	Very Good	Excellent
20-29	≤ 16 cm	17 to 21 cm	22 to 25 cm	26 to 29 cm	≥ 30 cm
30-39	≤ 15 cm	16 to 20 cm	21 to 24 cm	25 to 29 cm	≥ 30 cm
40-49	≤ 13 cm	14 to 18 cm	19 to 22 cm	23 to 26 cm	≥ 27 cm
50-59	≤ 13 cm	14 to 18 cm	19 to 21 cm	22 to 27 cm	≥ 28 cm
60-69	≤ 11 cm	12 to 15 cm	16 to 19 cm	20 to 23 cm	≥ 24 cm

Table 5.1.2: Ratings for the Sit-and-Reach Test in Centimeters for Biological Adult Females

Age	Poor	Fair	Good	Very Good	Excellent
20-29	≤ 13 cm	14 to 18 cm	19 to 22 cm	23 to 28 cm	≥ 29 cm
30-39	≤ 11 cm	12 to 16 cm	17 to 21 cm	22 to 26 cm	≥ 27 cm
40-49	≤ 6 cm	7 to 12 cm	13 to 17 cm	18 to 23 cm	≥ 24 cm
50-59	≤ 4 cm	5 to 12 cm	13 to 16 cm	17 to 23 cm	≥ 24 cm
60-69	≤ 3 cm	4 to 8 cm	9 to 13 cm	14 to 21 cm	≥ 22 cm

According to the American College of Sports Medicine, Table 5.1.1 and Table 5.1.2 indicate the ratings of lower back and hamstring flexibility of adult males and females based on sit-and-reach results (American College of Sports Medicine, 2021). ^[1]

Regarding individual flexibility, here are what the percentiles generally indicate:

- Excellent = Greater than or equal to the 90th percentile
- Very Good = between 80th and 89th percentiles
- Good = between 60th and 79th percentiles
- Fair = between 30th and 59th percentiles
- Poor = Less than 30th percentile

Shoulder Flexibility Test

This test gauges the flexibility of your shoulders.

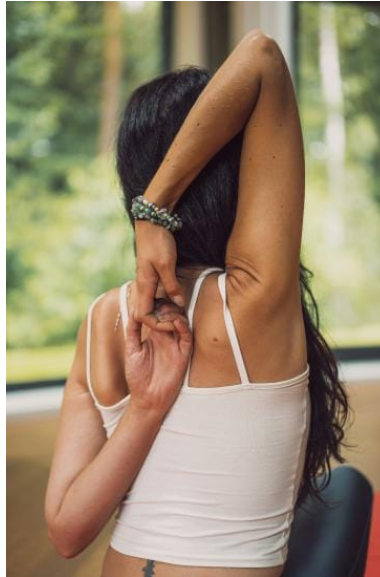


Figure 5.1.2: A shoulder flexibility test. (Woman in white spaghetti straps; THLT LCX via Unsplash)

Equipment

- A small ruler or tape measure
- A partner to check measurements.

Instructions

1. To prepare, warm up for 5-10 minutes with a low-intensity aerobic activity.
2. Do some gentle stretching of your shoulders, such as shoulder circles.
3. Raise your right arm overhead, bend your elbow, and reach between your shoulder blades as far as possible with your palm against your back. See Figure 5.1.2.
4. At the same time, extend your left arm down towards the ground and then bend your elbow and reach up behind your back. Try to touch or overlap your fingers of both hands.
5. Your partner will measure the distance that your fingers overlap or the distance between your fingers to the nearest quarter inch. If your fingers overlap, the score is a positive number. If your fingers do not touch, the score is a negative number.
6. Repeat with the left arm up and the right arm down.

Results

Your score is the average of the two measurements. The distance between the overlap of your fingers (positive number) or the distance between your fingertips (negative number).

Right Elbow Up: _____ inches

Left Elbow Up: _____ inches

Average of two measurements: _____ inches

Rate Your Results

Find the rating that corresponds to your results in Table 5.1.3.

Rating: _____

Table 5.1.3: Ratings for Shoulder Flexibility Test

Rating	Average of Two Sides in Inches
Excellent	≥ 5
Above Average	2 to 4.75
Average	0 to 1.75
Below Average	- 1 to - 0.25
Poor	$< - 1$

According to the Exercise Testing and Prescription: A Health-Related Approach, Table 5.1.3 indicates the ratings of shoulder flexibility based on the average results of the shoulder flexibility test (Nieman, 2010). ^[25] In terms of percentiles, the ratings indicate similar ranges as most fitness tests, although it is not specified in the text.

Straight Leg Raise (SLR) Test

This test gauges your hip flexor and hamstring flexibility (American College of Sports Medicine, 2021). ^[1]

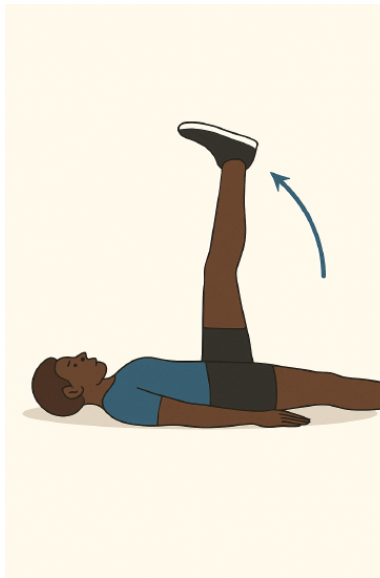


Figure 5.1.3: Straight leg test, both legs straight. Created by ChatGPT.



Figure 5.1.4: Straight leg test, with leg bent. Created by ChatGPT.

Equipment

- Goniometer or measuring tool (optional)
- A Partner to measure (or estimate based on a 90-degree angle)

Instructions

1. To prepare, warm up for 5-10 minutes with a low-intensity aerobic activity.
2. Do some gentle stretching of your hamstrings and lower back.
3. Lie on your back on a flat surface with both legs straight and relaxed and arms resting at your side.
4. Raise the right leg slowly upward while keeping the knee straight (fully extended) as illustrated in Figure 5.1.3. The left leg should remain flat on the surface.
 - NOTE: If this causes discomfort to the lower back, bend the left leg and keep the left foot flat on the floor as illustrated in Figure 5.1.4. This will change the degree range of your rating.
5. Lift your leg until:
 - Resistance is felt
 - The pelvis begins to tilt upward
 - You feel tightness or discomfort in the hamstrings
6. Compare the range of motion in the raised straight leg relative to a 90-degree position perpendicular to the floor at your point of imitation.
7. If your partner has a goniometer or measuring device, you can obtain a more precise measurement of the joint (hip-flexion) angle.
8. Repeat with the left leg.

Notes

- Avoid flexing the knee during the raise.
- Watch for compensatory movements (e.g., opposite hip lifting or pelvis tilting).
- Compare both legs.
- Always perform the test slowly and gently to avoid injury.

Results

Your score is the degree or the estimated degree of your hip joint (hip-flexion) angle. Note for each leg whether hamstring

flexibility is below average, average, or above average.

Right Leg: _____ (estimate)

Left Leg: _____ (estimate)

If you used a goniometer or other measuring device, note the measurements for both legs.

Right Leg: _____ degrees

Left Leg: _____ degrees

- Below average = <70 degrees (Both legs straight), less than 90 degrees (Base leg bent)
- Average = 70 - 90 degrees (Both legs straight), 90 degrees (Base leg bent)
- Above Average = Greater than 90 degrees

Both legs Straight:

- With both legs straight, normal hamstring flexibility is approximately 70–90 degrees.
- Less than 70 degrees may indicate hamstring tightness.
- If pain is felt in the posterior thigh or lower back, this may suggest neural tension, not just flexibility limits.

Trunk Rotation (spinal range of motion) Flexibility Test

This test evaluates the rotational range of motion (ROM) of the thoracic spine, lumbar spine, and associated muscles (especially obliques and spinal rotators).

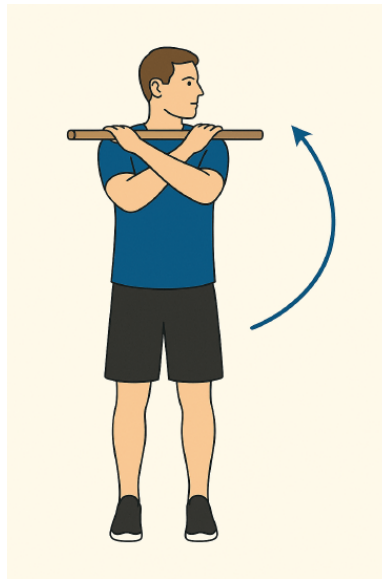


Figure 5.1.5: An illustration of the starting position for the trunk rotation test, with an arrow indicating the initial rotation to the right. Created by [ChatGPT](#).

Equipment

- Dowel rod or broomstick (optional, for posture alignment)
- Assistant/partner for observing and recording (optional)

Instructions

Before you begin:

1. Stand or sit upright with feet shoulder-width apart.
2. Hold a dowel rod across the shoulders (resting on the trapezius), or cross arms over the chest.
3. Keep hips and knees facing forward throughout the test.

Perform the test:

1. Stand tall, looking straight ahead. Ensure that the hips remain stationary and the spine is upright. NOTE: This test can also be done seated on a bench or a backless chair.
2. Slowly rotate your upper body to the right as far as possible without twisting the hips.
3. Pause and note how far you rotated.
4. Return to the center and repeat on the left side.

Tips for Accuracy

- Keep hips and lower body still; only the upper torso should move.
- Perform the test slowly to avoid momentum.
- Repeat for consistency; use the better of two attempts or average them.

Results

Scoring your results is based on a visual scale.

Table 5.1.4: Visual Rating Scale adapted from TopEnd Sports (Wood, n.d.)^[36]

Description of Rotation		Rating
Shoulders turn past the hips		Excellent
Shoulders in line with hips		Good
Partial turn		Fair
Minimal rotation		Poor

Summary of Results

Use Table 5.1.5 to record all of your results.

Table 5.1.5: Table of summary results by Danielle Altman is licensed CC BY-NC 4.0

Test	Score		Rating
Sit-and-Reach Test			
Shoulder Flexibility Test			
Straight Leg Raise Test	Right:		Right:
	Left:		Left:
Trunk Rotation Test	Right:		Right:
	Left:		Left:

Reflecting on Your Results Edit section

Answer the following questions to be able to understand better your awareness of your current range of motion and flexibility levels.

1. Are you at all surprised by your ratings for flexibility?
2. What factors, if any, influenced your ability to perform these assessments?
3. Are you satisfied with your current level of flexibility as evidenced in your daily life? For example, are you happy with your ability to bend down to put on your shoes and socks, squatting down to pick up items, reaching overhead, or turning your head to look behind you while driving?

Taking Action

Your next steps include setting S.M.A.R.T. goals for improvement and creating a workout plan to achieve them.

1. Use Lab [5.11.2 "Creating a Program"](#) to describe your goals and the specific steps you will take to improve your flexibility and range of motion.
2. Repeat these flexibility tests every 3-4 weeks to measure improvements.

Question

- What effect did your plan have on your range of motion and flexibility level?
- Did your test scores improve?
- Do you feel like you can perform daily activities with more ease?

5.2: Creating a Program

Lab 5.2

Name:

Date:

Creating a Flexibility Program

Instructions

When starting any part of a fitness program, it is important to begin by setting goals.

Set S.M.A.R.T. Goals: Specific, Measurable, Attainable, Realistic, Time-Bound

Examples:

- Number of stretching sessions per week
- Improving range of motion (based on your own assessments)

Table 5.2.1: A table to set up a S.M.A.R.T. Goals by Danielle Altman is licensed CC BY-NC 4.0

Goal	Target Date	Notes (Rewards)

Apply the FITT Principle

- Frequency: 2-3 days a week or more
- Intensity: Stretch to the point of slight tension or mild tightness
- Time: Hold the stretch for 15-60 seconds and do four or more repetitions of each stretch
- Type: Perform a stretch for each major muscle or joint, including the neck, shoulders, arms, upper and lower back, pelvis, hips, and legs.

Table 5.2.2: A table to set up a S.M.A.R.T. Goals by Danielle Altman is licensed CC BY-NC 4.0

Exercise	

Exercise	

Results

Track progress using a strength-training log, such as the sample in Table 5.2.3: Flexibility Training Log.

Table 5.2.3: A sample strength training log by Danielle Altman is licensed CC BY-NC 4.0

Date	Duration/Time	Workout or Muscle Groups Stretched

5.3: Evaluating Posture

Lab 5.3

Name:

Date:

Evaluating Standing Posture

Equipment

- Partner

Instructions

- This questionnaire will help you to evaluate your standing posture and recognize areas in your body where you may need to adjust alignment.
- Have your partner answer the questions by comparing your typical standing position to the Figure 5.3.1.

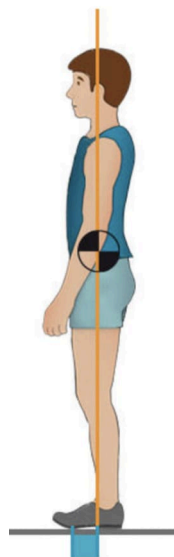


Figure 5.3.1: Proper standing posture, with the ears, shoulders, hips, knees, and ankles in a straight line. (CC B-SA 4.0; Othokin via [Wikimedia Commons](#))

Proper Posture Alignment from the Side

Yes	No	
		Is there a straight line between the ear, shoulder, hip, knees
		Is the back mostly straight, while allowing the natural curve
		Are the shoulders rounded forward, or is there excessive arc

Yes		No
		Is the neck straight (chin is neutral - not sticking out or pull
		Are your shoulders blades back and chest forward?
		Are your knees straight but not locked?

Table 5.3.1: Posture alignment from the side questions based on yoga certifications by [Danielle Altman](#) is licensed [CC BY-NC 4.0](#)

Reflecting on Your Results

Answer the following questions to be able to understand better your awareness of your current postural position and how to make adjustments.

1. If the answer was "no" on any of the questions, consider what your potential posture problem?
2. If you have any concerns, what are some adjustments you can make to improve your posture?

6: BODY COMPOSITION

6.1: Body Mass Index Calculations

6.2: Body Fat Distribution Calculations

6.3: Setting Body Composition Goals

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Lab 6.1

Name:

Date:

Calculating Body Mass Index

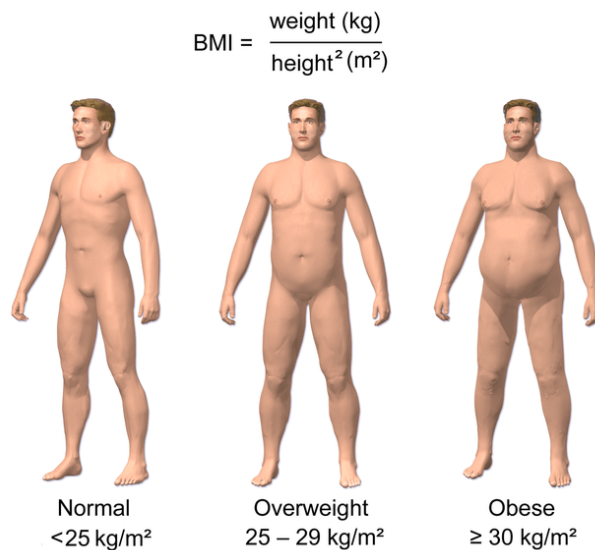


Figure 6.1.1: A digital illustration of how the body changes based on body mass index ranges. On the left, a normal-sized body is labeled with a BMI of less than 25 kilograms per square meter. The figure in the middle illustrates a larger stomach and heavier limbs and is labeled as overweight with a BMI range of 25-29 kilograms per square meter. On the right, the figure has a large, round stomach and a bigger chest and is labeled as obese with a BMI of greater than or equal to 30 kilograms per square meter. Above the figures is the BMI formula of weight divided by height squared. (CC By-SA 4.0; BruceBlaus via Wikimedia Commons)

Equipment Needed

- Weight scale
- Tape measure

Instructions

- Height – Remove your shoes and stand straight against a wall to measure your height. Record the measurement and include the unit (e.g., inches or centimeters).
- Weight – Weigh yourself wearing minimal clothing. Record the number and include the unit (e.g., pounds or kilograms).
- Waist Circumference – Measure your waist at its narrowest point, usually just above the belly button. For accuracy, have someone stand beside you and wrap the measuring tape flat against your skin, keeping it level and parallel to the floor. Record the measurement and include the unit (e.g., inches or centimeters).

Record the values measured.

Table 6.1.1: Measurement Input

Height		in/m
Weight		lb/kg
Waist Circumference		in/cm

Calculate Target BMI (Goal)

Convert the body weight to kilograms (if needed) using this conversion

$$\text{Body Weight (lbs)} \div 2.2 \text{ (kg/lb)} = \text{Body Weight (kg)}$$

Convert the height measurement to meters (if needed) using this conversion

$$\text{Height (in)} \times 0.0254 \text{ (m/in)} = \text{Height (m)}$$

Square the height measurement (in meters).

$$\text{Height (m)} \times \text{Height (m)} = \text{Height}^2 \text{ (m}^2\text{)}$$

BMI equals body weight in kilograms divided by height in meters squared.

$$\text{BMI} = \text{Body Weight (kg)} \div \text{Height}^2 \text{ (m}^2\text{)}$$

Results

Refer to the table to find your BMI category. Then, use your waist circumference to assess your additional health risk level.

Table 6.1.2: BMI Classification and Risk of Disease

BMI Category	BMI (kg/m ²)	Men: Waist ≤ 40 in (102 cm) Women: Waist ≤ 35 in (88 cm)
Underweight	< 18.5	
Normal or Healthy Weight	18.5 - 24.9	
Overweight	25.0 - 29.9	Increased
Obese	30.0 - 34.9 35.0 - 39.9 > 40.0	High Very High Extremely High

Data in Table 6.1.2 is adapted from information on the [CDC website](#) (Centers for Disease Control and Prevention, 2024). ^[18]

Final Recording

Record both your BMI category and waist-related risk.

BMI Category:

Waist Related Risk:

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6.2: Body Fat Distribution Calculations

Lab 6.2

Name:

Date:

Body Fat Distribution Calculations

Waist Circumference Measurement

Waist circumference is a straightforward and widely used method for estimating abdominal fat, which is a key indicator of central (visceral) obesity. Unlike general body weight or BMI, waist circumference specifically targets fat stored around the midsection—an area strongly linked to higher health risks. Excess abdominal fat increases the likelihood of developing conditions such as heart disease, type 2 diabetes, hypertension, and metabolic syndrome.

Equipment Needed

Tape Measure

Instructions

When measuring the waist circumference, place the tape measure at the narrowest part of the torso, usually just above the belly button and below the rib cage. If there is no clear narrowing, measure at the midpoint between the lowest rib and the top of the iliac crest (hip bone). The tape should be snug but not compressing the skin, and kept level and parallel to the floor.

Record the Results

Waist Circumference (in):

According to health guidelines, a waist measurement greater than 40 inches (102 cm) in men and 35 inches (88 cm) in women is associated with a significantly increased risk of chronic disease, even in individuals with a normal BMI (Centers for Disease Control and Prevention, 2022).^[17]

Waist to Hip Ratio Measurement

Waist-to-hip ratio (WHR) is a widely used indicator of fat distribution in the body, particularly useful for identifying central (abdominal) obesity versus peripheral (hip and thigh) fat accumulation. WHR provides insight into how fat is distributed—whether it is more concentrated around the abdomen (apple-shaped) or the hips (pear-shaped). This distinction is important because abdominal fat is more metabolically active and associated with a greater risk of developing serious health conditions, including cardiovascular disease, stroke, type 2 diabetes, and certain cancers.

Equipment Needed

Tape Measure

Instructions

The WHR ratio is calculated by dividing the circumference of the waist by the circumference of the hips, both measured with a flexible measuring tape while standing.

When measuring the waist circumference, place the tape measure at the narrowest part of the torso, usually just above the belly button and below the rib cage. If there is no clear narrowing, measure at the midpoint between the lowest rib and the top of the iliac crest (hip bone). The tape should be snug but not compressing the skin, and kept level and parallel to the floor.

When measuring the hip circumference, measure at the widest part of the buttocks or hips. This is typically around the level of the greater trochanters (the bony parts of the upper thighs) and across the fullest part of the buttocks. Ensure the tape is horizontal and not twisted.

Record the Results

Waist Circumference (in):

Hip Circumference (in):

Calculate Waist to Hip Ratio

Waist Circumference (in) ÷ Hip Circumference (in) = Waist to Hip Ratio (WHR)

A WHR greater than 0.90 in men or 0.85 in women is considered an indicator of elevated health risk. These thresholds, established by the World Health Organization, reflect the point at which abdominal fat distribution becomes significantly associated with negative health outcomes, regardless of overall weight or BMI (World Health Organization, 2011). ^[92]

Waist to Height Ratio

Waist-to-height ratio (WHtR) is a simple yet powerful tool for assessing body fat distribution and estimating health risks associated with abdominal obesity. It compares an individual's waist circumference to their height, providing a proportion that reflects central fat accumulation relative to body size. Unlike BMI, which does not account for fat distribution or distinguish between fat and muscle mass, WHtR offers a clearer picture of visceral fat levels—a key risk factor for cardiovascular disease, type 2 diabetes, and early mortality.

Equipment Needed

Tape Measure

Instructions

The WHtR ratio is calculated by dividing the circumference of the waist by the circumference of the hips, both measured with a flexible measuring tape while standing.

When measuring the waist circumference, place the tape measure at the narrowest part of the torso, usually just above the belly button and below the rib cage. If there is no clear narrowing, measure at the midpoint between the lowest rib and the top of the iliac crest (hip bone). The tape should be snug but not compressing the skin, and kept level and parallel to the floor.

When measuring height, measure standing straight, without shoes, against a wall or flat surface. Use a partner if available for better accuracy.

Record the results

Waist Circumference (in):

Height (in):

Calculate Waist to Height (WHtR) Ratio

Waist Circumference (in) ÷ Height (in) = Waist to Height Ratio (WHtR)

A WHtR greater than 0.5 indicates an increased risk of health problems in both men and women, across different ethnic groups and age ranges. In contrast to BMI, which can be less accurate for individuals with varying body compositions, WHtR provides a consistent and reliable indicator of central obesity and related health risks. Some researchers suggest WHtR may be a better predictor of cardiometabolic risk than either BMI or waist circumference alone (American Council on Exercise, 2023). ^[4]

Body Fat Percentage Calculation

The U.S. Navy Body Fat Formula is a widely used method for estimating body fat percentage based on circumference measurements and height. The formulas are sex-specific, as men and women store fat differently across their bodies. This method estimates body fat percentage, which can help evaluate overall health and fitness status. While not as precise as clinical tools like DEXA, it provides a useful approximation that is especially valuable for field use in military, athletic, and educational settings. The U.S. Department of Defense uses this calculation to determine compliance with body composition standards for service members (Department of the Navy, 2002). ^[23]

Equipment Needed

Tape Measure

Instructions

Measurements should be taken at the end of a normal exhalation for consistency and accuracy. It's best to measure in light clothing or against bare skin.

- Waist: Measure at the narrowest point of the torso, typically just above the belly button. Keep the tape horizontal and snug but not compressing the skin.
- Neck: Measure just below the larynx (Adam's apple), with the tape angled slightly downward at the front.
- Hip (women only): Measure at the widest part of the buttocks.
- Height: Measure standing straight, without shoes, preferably against a flat wall.

Record the Results

Waist Circumference (in):

Neck Circumference (in):

Hip Circumference (in):

Height (in):

Calculate Body Fat Percentage

Males

$$\text{Body Fat Percentage} = 86.010 \times \log_{10} (\text{Waist} - \text{Neck}) - 70.041 \log_{10} (\text{Height}) + 36.76$$

Females

$$\text{Body Fat Percentage} = 163.205 \times \log_{10} (\text{Waist} + \text{Hip} - \text{Neck}) - 97.684 \log_{10} (\text{Height}) - 78.387$$

Results

Calculated Body Fat Percentage:

6.3: Setting Body Composition Goals

Lab 6.3

Name:

Date:

Body Composition Goal Setting

Equipment Required

Tape Measure and Scale

Measurements

Input these values calculated in Lab 6.1 and 6.2.

Table 6.3.1: Measurements

Height		in/cm/m
Weight		lb/kg
Current BMI		kg/m ²
Current % Body Fat		%

Body Weight Goal - BMI

Based on the BMI ratings and your current BMI, select a BMI goal and input below.

Table 6.3.2: Goal BMI

Current BMI		kg/m ²
Goal BMI		kg/m ²

Calculate Target Body Weight

Convert your height measurement (if needed) to meters using the conversion

$$\text{Height (in)} \times 0.0254 \text{ (m/in)} = \text{Height (m)}$$

Square the Height measurement in meters

$$\text{Height (m)} \times \text{Height (m)} = \text{Height}^2 \text{ (m}^2\text{)}$$

Multiply your goal BMI from above by the squared height calculated in step 2.

$$\text{Body Weight Goal (kg)} = \text{Target BMI (kg/m}^2\text{)} \times \text{Height}^2 \text{ (m}^2\text{)}$$

Convert your mass calculation into pounds using the conversion

$$\text{Body Weight Goal (kg)} \times 2.2 \text{ (lbs/kg)} = \text{Body Weight Goal (lbs)}$$

Record Results

Body Weight Goal (lbs):

7: CREATING A FITNESS PROGRAM FOR LIFELONG HEALTH

7.1: Physical Activity Diary (Lab 7.1)

7.2: Evaluating Fitness Apps and Wearable Fitness Devices (Lab 7.2)

7.3: Person Fitness Program Plan (Lab 7.3)

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7.1: Physical Activity Diary (Lab 7.1)

Lab 7.1

Name:

Date:

My Physical Activity Diary

Week:

Month:

Physical Activity Diary Monday

Time of Day	Description of Activity (Type and Intensity Level)	Duration	Feelings, Mood, other thoughts Before and after exercise

Physical Activity Diary Tuesday

Time of Day	Description of Activity (Type and Intensity Level)	Duration	Feelings, Mood, other thoughts Before and after exercise

Physical Activity Diary Wednesday

Time of Day	Description of Activity (Type and Intensity Level)	Duration	Feelings, Mood, other thoughts Before and after exercise

Physical Activity Diary Thursday

Time of Day	Description of Activity (Type and Intensity Level)	Duration	Feelings, Mood, other thoughts Before and after exercise

Physical Activity Diary Friday

Time of Day	Description of Activity (Type and Intensity Level)	Duration	Feelings, Mood, other thoughts Before and after exercise

Physical Activity Diary Saturday

Time of Day	Description of Activity (Type and Intensity Level)	Duration	Feelings, Mood, other thoughts Before and after exercise

Physical Activity Diary Sunday

Time of Day	Description of Activity (Type and Intensity Level)	Duration	Feelings, Mood, other thoughts Before and after exercise

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7.2: Evaluating Fitness Apps and Wearable Fitness Devices (Lab 7.2)

Lab 7.2

Name:

Date:

Evaluating Fitness Apps and Wearable Fitness Devices

Lab Objective

Explore how fitness apps and wearable devices support a specific physical activity of your choice (e.g., hiking, gym workouts, running, cycling). Evaluate these tools based on their features, cost, reliability, usability, coaching capabilities, and how well they motivate and support long-term engagement.

Instructions

Research Fitness Tracking Apps

Select at least two fitness apps (e.g., Strava, MyFitnessPal, Nike Training Club, AllTrails, MapMyRun, Jefit). Focus on your primary physical activity/exercise. You may discover that one app covers all your needs (e.g., tracking, coaching, music), or you may need to combine multiple apps. Explore and rate each app based on your usage, the features it offers, and external reviews.

Consider: Does the app require a phone/watch to function or can it be used offline or with a wearable? Does the app include built-in coaching (audio cues, video instruction, workout plans)? Does it integrate music features (Spotify, Apple Music, curated workout playlists)?

Research Wearable Tracking Devices

Select at least two wearable devices (e.g., Fitbit, Apple Watch, Garmin, WHOOP, Oura Ring). Choose one that fits best with your activity needs, cost, and lifestyle. Evaluate features based on research, user reviews, or personal experience.

Question

- Does the device need to be paired with a phone at all times, or can it function independently?
- Does the device offer coaching or guided workouts via app or audio?
- Can you play music directly from the device, or does it control music from a connected phone?

Use this table as a guide to organize your findings. Base evaluations on your activity and include specific examples. You can create your own table to input your findings.

Criteria	Fitness App	Wearable Device	Other thoughts?
Core Features	Workout logging, coaching, nutrition, route maps	Heart rate, steps, GPS, sleep, VO ₂ Max, activity zones	
Ease of Use	Setup, navigation, app interface	Fit, controls, screen visibility during activity	
Phone Dependency	Can it work without a phone or Wi-Fi?	Standalone functionality vs phone pairing needed	
Cost	Free, one-time fee, subscription (list tiers & prices) Are education discounts available?	Upfront cost, monthly plans, accessories	
Accuracy & Reliability	Based on personal use or user/tester reviews	Accuracy in tracking heart rate, sleep, GPS, etc.	
Compatibility	Works on iOS/Android, syncs with wearables	Compatible with chosen apps and platforms	
Motivation & Adherence	Reminders, goals, can share/compete with others	Progress feedback, social badges, challenges	
Coaching Provided	Yes/No-Included cues, plans, trainers?	On-screen guidance, audio prompts, companion app	
Music Integration	Built-in playlists, Spotify/Apple Music syncing.	Music storage/control or playback via device	
Privacy & Data Use	Transparent data use, ability to export/share?	Use control over syncing and data sharing	

Reflection Questions

Respond to the following in short paragraph format:

1. Which app and device best supported your chosen activity, and why?
2. Did you find one app that met all your needs, or did it take two or more?
3. How did coaching features influence your motivation or confidence?
4. Was music integration important to your workout experience?
5. Did phone dependency interfere with your activity?
6. Were there barriers related to cost, usability, or accessibility?
7. What should users consider before adopting fitness technology into their routine?

Bonus: Optional Field Test

Try using your selected app and wearable device during 2–3 activity sessions:

Keep a short log after each:

Did the app or device enhance the session (e.g., music, coaching, or feedback)?

Was the experience seamless or frustrating?

Did the data help you reflect or adjust your fitness approach?
Do you think the free version is sufficient?

Submission Guidelines

Submit a 2–4 page report including:

1. Evaluation table
2. Reflection question responses
3. Optional field test log (if completed)

Cite any sources (app reviews, product specs, articles) in APA format

Alternate Version: Evaluating Fitness Apps and Wearable Fitness Devices

This page can be printed and filled out as a PDF. If you prefer a fillable PDF, it can be downloaded through the following link.

[Evaluating Fitness Apps and Wearable Fitness Devices](#)

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7.3: Person Fitness Program Plan (Lab 7.3)

Lab 7.3

Name:

Date:

Lab Assignment: Comprehensive Fitness Assessment Review

Throughout this course, you have completed individual assessments targeting each of the five components of health-related physical fitness: cardiovascular endurance, muscular strength, muscular endurance, flexibility, and body composition. Each assessment allowed you to explore specific methods used to evaluate different aspects of fitness, practice proper testing protocols, and interpret personal results.

This final lab brings all of these elements together in one complete fitness profile. By compiling your previous assessments into a single, comprehensive document, you will be able to reflect on your current fitness status, observe strengths and areas for improvement, and begin to think critically about how these components interact to influence overall health and performance.

How will this help me?

- Review and synthesize data from multiple fitness assessments.
- Understand how each component contributes to total fitness and health.
- Form realistic, personalized goals (specific or short-term goals, general or long-term goals) for improvement or maintenance.

Take this opportunity to look at the “big picture” of your fitness and use it as a foundation for planning your new fitness program.

By carefully developing your plan and signing an agreement, you will increase your chances of success. Consider having a family member, friend as a witness.

Goal Setting/Personal Fitness Contract

Fitness Program and Contract

I, [name], am setting a contract with myself to actively participate in a physical fitness plan designed to meet the goals listed below:

Specific or short-term goals

Specific or short-term goals
1.
2.
3.
4.

General or Long-term goals

General or long-term goals
1.
2.
3.

General or long-term goals

4.

General Activity Plan

Activities		Components			Frequency				
CRE		MS		ME	F		BC		

* Include your target heart rate range or RPE value if appropriate.

CRE=Cardiorespiratory Endurance, MS=Muscular Strength, ME= Muscular Endurance, F=Flexibility, BC= Body Composition

Be sure to include multi-component training in your program.

Program Initiation

Start Date:

My program includes the following schedule of mini-goals. For each step in my program, I will give myself the reward listed when I have accomplished the goal.

Program Goals and Rewards

Goal	Date	Reward
1.		
2.		
3.		
4.		
5.		

Every Day Physical Activity

My fitness plan includes integrating everyday physical activity into my routine, such as using the stairs or walking between classes.

1.
2.
3.
4.

Strategies to Reduce Sedentary Time

My program will incorporate the following strategies to reduce sedentary behavior.

1.
2.

My program will incorporate the following strategies to reduce sedentary behavior.

3.

Tools to Monitor Program and Progress

To help me stay accountable and monitor my progress, I will use technology like wearable fitness trackers (e.g., Apple Watch, Garmin, Fitbit) and mobile health apps.

1.

2.

I am signing this contract as a personal commitment to work toward and achieve my fitness goals.

Signature

Date

I have recruited a helper:

They will witness my contract and have committed to participate with me:

(List how your helper will participate in your program. For example, walking with you 1 day a week.)

8: NUTRITION

8.1: Calculating TDEE and Macronutrient Intake Goals

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8.1: Calculating TDEE and Macronutrient Intake Goals

Lab 8.1

Name:

Date:

Energy Intake vs. Energy Expenditure

Weight gain and weight loss are largely due to your energy intake (calories consumed) versus your energy expenditure (total calories burned) every day. The first step in designing a personal nutrition plan for yourself is to calculate how many calories you burn in a day, your total daily energy expenditure (TDEE). TDEE is the total number of calories that your body expends in 24 hours, including all activities. TDEE is also known as your "maintenance level". Knowing your maintenance level will give you a starting reference point from which to begin your diet. According to exercise physiologists William McArdle and Frank Katch, the average maintenance level for women in the United States is 2000-2100 calories per day, and the average for men is 2700-2900 per day. These are only averages; caloric expenditure can vary widely and is much higher for athletes or extremely active individuals. Some triathletes and ultra-endurance athletes may require as many as 6000 calories per day or more just to maintain their weight! Calorie requirements may also vary among otherwise identical individuals due to differences in inherited metabolic rates.

The Harris-Benedict Formula

The Harris-Benedict formula is a calorie formula using the factors of height, weight, age, and sex to determine basal metabolic rate (BMR). This makes it more accurate than determining calorie needs based on total body weight alone. The only variable it does not take into consideration is lean body mass. Therefore, this equation will be very accurate in all but the extremely muscular (will underestimate caloric needs) and the extremely overweight (will overestimate caloric needs).

Men

$$\text{BMR} = 66 + (13.7 \times \text{Weight in kg}) + (5 \times \text{Height in cm}) - (6.8 \times \text{Age in years})$$

Women

$$\text{BMR} = 655 + (9.6 \times \text{Weight in kg}) + (1.8 \times \text{Height in cm}) - (4.7 \times \text{Age in years})$$

Examples: Basal Metabolic Rate Calculation

Example 1:

You are female
You are 30 years old
You are 5'6" tall (167.6 cm)
You weigh 120 lbs (54.6 kg)
Your BMR = $655 + 523 + 302 - 141 = 1339$ Calories/day

Example 2:

You are male
 You are 39 years old
 You are 6'2" tall (188 cm)
 You weight 205 lbs (93 kg)
 Your BMR = $66 + 1274 + 940 - 265 = 2015$ Calories/day

Calculating Total Daily Energy Expenditure (TDEE)

Now that you know your BMR, you can calculate TDEE by multiplying your BMR by your activity multiplier. Choose the appropriate multiplier from Table 8.1.1 below.

Table 8.1.1: BMR Activity Multiplier for TDEE Calculation

Activity Level	Multiplier	Description
Sedentary	BMR x 1.2	Little or no exercise; desk job
Lightly Active	BMR x 1.375	Light exercise/sports 1-3 days per week
Moderately Active	BMR x 1.55	Moderate exercise/sports 3-5 days per week
Very Active	BMR x 1.725	Hard exercise/sports 6-7 days per week
Extremely Active	BMR x 1.9	Hard daily exercise/sports and physical job or 2x per day training

Examples: Total Daily Energy Expenditure Calculation

Example 1:

Your BMR is 1339 calories per day
 Your activity level is very active (working out 6-7 days per week)
 Your activity multiplier is 1.725
 Your TDEE = $1.72 \times 1339 = 2303$ calories per day

Example 2:

Your BMR is 2015 calories per day
 Your activity level is moderately active (work out 3-4 times per week)
 Your activity multiplier is 1.55
 Your TDEE = $1.55 \times 2015 = 3123$ calories per day

Developing Your Nutritional Goals

Table 8.1.2: BMR and TDEE Calculations

Item	Fill in the Personal Information
Age:	
Height in cm	
Weight in kg	
Ideal body weight:	
Female BMR:	$655 + (9.6 \times \text{weight [kg]}) + (1.8 \times \text{height [cm]}) - (4.7 \times \text{age [yrs]}) =$ _____ calories
Male BMR:	$65 + (13.7 \times \text{weight [kg]}) + (5.0 \times \text{height [cm]}) - (6.8 \times \text{age [yrs]}) =$ _____ calories

Item	Fill in the Personal Information
Activity Level & Multiplier:	
Total Daily Energy Expenditure	Calculated BMR x Activity Multiplier = _____ calories/day

Nutritional Plan and Breakdown of Nutrients

First, decide how much of your daily calories you want to come from carbohydrates, proteins, and fats. Use the recommended percentage ranges so that your total adds up to 100%.

Table 8.1.3: Ideal Nutrient Percentage Range of Total Diet

Nutrient	Ideal Percentage Range of Total Diet
Protein	15-35%
Fat	10-30%
Carbohydrates	20-45%

Examples Nutrient Range Breakdowns

Example 1:

Protein (30%) + Fat (25%) + Carbohydrates (45%) = Total Nutrients (100%)

Example 2:

Protein (35%) + Fat (25%) + Carbohydrates (40%) = Total Nutrients (100%)

Example 3:

Protein (25%) + Fat (30%) + Carbohydrates (45%) = Total Nutrients (100%)

Next, figure out how many calories you need each day based on your fitness goal—whether you’re trying to lose weight, gain weight, or maintain your current weight.

If you’re trying to lose weight, you should eat 250 to 500 fewer calories per day than your body needs to maintain weight. However, you should never go below 1,200 calories a day, because that can slow down your metabolism and put your body into “starvation” mode.

If your goal is to maintain your current weight, you should eat the number of calories that matches your Total Daily Energy Expenditure (TDEE).

If your goal is to gain weight, you’ll need to eat 500 to 1,000 more calories per day than your TDEE, depending on how quickly you want to gain. Most of these extra calories should come from carbohydrates, since they are your body’s main energy source. To gain muscle, it’s also important to include strength training, weightlifting, or resistance exercises in your routine.

Examples: Maintenance, Weight Loss or Weight Gain

Example 1:

My TDEE is 2500 calories, and my goal is to lose weight.
 2500 - 500 calories = 2000 calories/day to lose weight

Example 2:

My TDEE is 1600 calories, and my goal is to lose weight.
 $1600 - 150 \text{ calories} = 1450 \text{ calories/day to lose weight}$

Example 3:

My TDEE is 2200 calories, and my goal is to gain weight.
 $2200 + 500 \text{ calories} = 2700 \text{ calories/day to gain weight.}$

Final Calculation

Table 8.1.4: Final Nutrient Count

Item	Fill in Applicable Personal Information
Total Daily Energy Expenditure (TDEE)	
Goals (Maintain, Loss, Gain)	
Ideal Energy Intake for Goal	
Recommended Protein Intake (15-35%)	_____ % or _____ calories of Proteins
Recommended Fat Intake (10-30%)	_____ % or _____ calories of Fats
Recommended Carbohydrate Intake (20-45%)	_____ % or _____ calories of Carbs
All 3 Percentages must add up to 100%	_____ %

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9: WEIGHT MANAGEMENT FOR HEALTH AND WELLNESS

9.1: Weight Management Goal Setting Strategies

9.2: Your Diet vs MyPlate

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9.1: Weight Management Goal Setting Strategies

Lab 9.1

Name:

Date:

Instructions

Equipment: None

Preparation: None

Identify the Pros and Cons of Weight Loss

Think about the commitment to the process that will be necessary over an extended period, and think critically about how you can ultimately benefit from it as well. Someone who does not need to lose weight could find that the cons outweigh the pros when it comes to weight loss, which would guide their decision-making on the subject.

Table 9.1.1: Personal Pros and Cons to Weight Loss

Pros	Cons
1.	1.
2.	2.
3.	3.

Set a S.M.A.R.T. Goal

If you established a body weight goal in [Lab 6.3](#) using your body composition assessment, you may use that as your long-term goal. Alternatively, you can choose to set a lifestyle or behavior-related goal—such as improving your eating habits, increasing physical activity, or reducing stress—and determine the number of weeks you will need to achieve it. To help you develop a clear and effective objective, refer to the S.M.A.R.T. goal framework outlined in [Lab 1.2](#). Be sure to write a complete S.M.A.R.T. goal in the space provided below, ensuring it is Specific, Measurable, Achievable, Relevant, and Time-bound.

Calculate a Daily Calorie Deficit

If you have set a body weight goal—particularly one that involves weight loss—you will need to create and maintain a consistent negative calorie balance over time. This means that the number of calories you burn must exceed the number of calories you consume daily. To estimate how many calories you should reduce or burn each day, use the formulas provided below. These will help you calculate your daily calorie deficit goal and estimate the total number of weeks required to reach your desired weight safely and sustainably. Be sure to account for factors such as your activity level, metabolic rate, and realistic weight loss expectations (generally 1–2 pounds per week).

Calculate Total Weight to Lose

Current Weight (lbs) - Body Weight Goal (lbs) = Total Weight To Lose (lbs)

Determine Time to Achieve Target Weight Safely

Total Weight to Lose (lbs) ÷ Weekly Weight Loss * (lbs) = Time to Achieve Target (weeks)

Calculate the Weekly Negative Calorie Balance Needed

Weekly Weight Loss Target (lbs) x 3500 (cal/lb) = Weekly Negative Calorie Balance (cal/week)

Calculate the Daily Negative Calorie Balance Needed

Weekly Negative Calorie Balance (cal/week) ÷ 7 (days/week) = Daily Negative Calorie Balance (cal/day)

*A loss of no more than 1-2 lbs/week is recommended for most people.

You can create a daily negative calorie balance by either consuming fewer calories (eating less), increasing your energy expenditure (being more physically active), or a combination of both. For most individuals, combining these two approaches tends to be the most effective and sustainable method for achieving weight loss goals.

Strategies for Reducing Energy In

Identify at least three realistic and sustainable strategies you can use to reduce your daily calorie intake. These strategies might include eliminating or cutting back on certain high-calorie items from your usual diet—such as sugary drinks, fast food, or high-fat snacks—or replacing them with healthier, lower-calorie alternatives, like choosing water instead of soda or opting for low-fat milk instead of whole milk.

To help you make informed decisions, consider using one of the many free or low-cost nutrition tracking websites or mobile apps that can identify sources of empty calories—foods or drinks that provide calories with little or no nutritional value. Once you've selected your strategies, calculate the total number of calories you expect to save each day by making these changes. This information will help you better understand your overall energy balance and support your progress toward your goal.

Strategy #1

Calories input reduction (per day):

Strategy #2

Calories input reduction (per day):

Strategy #3

Calories input reduction (per day):

Strategies for Increasing Energy Out

Identify at least three realistic and achievable strategies to increase your daily calorie expenditure. These strategies may include incorporating more physical activity into your routine—such as going for brisk walks, biking, taking the stairs instead of the elevator, or participating in structured exercise like swimming, strength training, or fitness classes. You might also increase your overall movement throughout the day by standing more often, doing active chores, or adding short activity breaks during sedentary periods.

Once you've selected your strategies, use an activity tracker, fitness app, or online calorie calculator to estimate the number of additional calories you will burn with each activity. Then, calculate the total number of extra calories you expect to burn daily by implementing your chosen strategies. This will help you assess the effectiveness of your plan and support your progress toward creating a consistent negative calorie balance.

Strategy #1

Calories output increase (per day):

Strategy #2

Calories output increase (per day):

Strategy #3

Calories output increase (per day):

Reflection

Add up your calories cut and calories expended:

Have you successfully met your daily negative calorie balance goal based on your intake and activity levels? If not, review your

current strategies and consider making additional adjustments. You may need to further reduce your calorie intake, increase your physical activity, or both to create the necessary calorie deficit. Be sure any changes you make are realistic, sustainable, and aligned with your overall health goals. Remember, small, consistent improvements often lead to the most lasting results. Reevaluate your plan regularly to stay on track and make progress toward your weight or wellness goal.

9.2: Your Diet vs MyPlate

Lab 9.2

Name:

Date:

Instructions

This lab asks you to compare your diet to the pattern recommended by MyPlate. You can complete the analysis for 1 day, but for a more complete and accurate assessment of your diet, average, and then analyze the results from 3 days, including a weekday and a weekend day.

Fill in the recommended daily intake goals for each food group based on your energy level using www.choosemyplate.gov. Make as many copies of the log as needed to cover the number of days you are tracking. Record the amount of food you consume from each food group each day, using the appropriate measurements (cups, ounce equivalents, etc.). Complete your analysis by using the provided log or an online nutrition analysis tool or app (note: some are free while others may require payment).

Day of the week (circle): M T W Th F Sa Su

☐ = 1 cup or ounce equivalent. Draw a slash and fill half to indicate 1/2 cup or ounce equivalent.

Group/Amounts		Check Number Consumed	My Total	Target Total*
Grains (1 oz eq = 1 slice of bread, 1 cup dry cereal, 1/2 cup cooked rice or pasta)	Whole Grain	☐ ☐ ☐ ☐ ☐ ☐ ☐	oz eq	oz eq
	Other	☐ ☐ ☐ ☐ ☐ ☐ ☐	oz eq	oz eq
Vegetables (1 cup raw or cooked vegetables, 2 cups leafy greens)		☐ ☐ ☐ ☐ ☐ ☐ ☐	cups	cups
Fruits (1 cup fruit or juice, 1/2 cup dried fruit)		☐ ☐ ☐ ☐ ☐	cups	cups
Dairy (1 cup milk/yogurt, 1 1/2 oz natural cheese, 2 oz processed cheese)		☐ ☐ ☐ ☐ ☐	cups	cups
Protein (1 oz eq = 1 oz meat, 1 egg, 1/4 cup legumes, 1 Tbsp peanut butter, 1/2 oz nuts/seeds)	Low Sat Fat	☐ ☐ ☐ ☐ ☐ ☐ ☐	oz eq	oz eq
	High Sat Fat	☐ ☐ ☐ ☐ ☐ ☐ ☐	oz eq	oz eq
Oils (tsp)		☐ ☐ ☐ ☐ ☐ ☐ ☐	tsp	tsp

*Target total from [MyPlate](http://www.choosemyplate.gov).

Additional Information

Number of vegetable subgroups consumed (dark green, orange/red, starchy, legume, other)

Other foods that don't fit into the groups.

Comments (including environmental cues - locations, people, day/times - that triggered overeating or poor choices):

Results

Complete the following chart by averaging your totals for the number of days you tracked and then comparing them to the recommended MyPlate totals for each group.

Group/Amounts		My Average Total	Target Total*
Grains	Whole Grain	oz eq	oz eq
	Other	oz eq	oz eq
Vegetables		cups	cups
Fruits		cups	cups
Dairy		cups	cups
Protein	Low Sat Fat	oz eq	oz eq
	High Sat Fat	oz eq	oz eq
Oils (tsp)		tsp	tsp

Average number of vegetable subgroups consumed (dark green, orange/red, starchy, legume, other)

Other foods that don't fit into the groups.

Reflecting on Results

How did your diet compare to the recommended guidelines? Were there any areas where you consistently ate more or less than the suggested amounts? Keep in mind that these recommendations are averages, so it isn't necessary to meet each target every single day. However, your analysis provides a useful benchmark for identifying patterns. Were you surprised by any of the results?

Planning Next Steps

Select one food group where your intake could be improved—either by increasing or decreasing the amount you eat, or by choosing higher-quality options—to better align with the guidelines. Develop at least three strategies to improve your intake from this group. Reflect on the foods you recorded in your analysis: where could you make changes? What items might you add, reduce, or replace?

Strategy #1

Strategy #2

Strategy #3

If your usual daily eating habits align with the MyPlate pattern, congratulations—keep up the good work!

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10: STRESS, SLEEP, AND MENTAL HEALTH

10.1: Personal Stress Inventory

10.2: Reduce Stress in 10-Minutes

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10.1: Personal Stress Inventory

Lab 10.2

Name:

Date:

Personal Stress Inventory

This inventory is used to help your awareness of how stress is affecting you both physically and psychosocially. Use the following scale to answer the questions and label each with the number that applies.

- 1 = Never
- 2 = Rarely
- 3 = Sometimes
- 4 = Often
- 5 = Always

Section 1, Part A: Physical Symptoms of Stress

To what extent do you experience the following?

- Sweaty Palms
- Cold hands and Feet
- Tension headaches
- Migraine Headaches
- Teeth Grinding
- Neck pains
- Uncontrollable muscle spasms
- Pains in the shoulder, upper back, or both
- Low back pain
- Pain down the back of your legs(s)
- Shortness of breath]
- Susceptibility to minor illness
- Poor-quality sleep
- Hair, eyelash, or beard pulling
- Nail biting
- Frequent trips to the toilet
- Gastrointestinal pain or discomfort
- Diarrhea
- Constipation
- Nausea
- Chronic fatigue
- Binge eating
- Do not eat because you fear becoming fat
- Bulimia
- General malaise
- Cold sores, hives
- Restless legs or feet (toe or finger shaking)
- Repetitive joint cracking (neck, knuckles, etc.)

Section 1, Part B: Psychosocial Symptoms of Stress

How frequently do you experience the following?

- Not enough time in the day
- Trouble concentrating (difficulty thinking clearly)
- Anxiety from causes that you cannot pinpoint
- Irritability
- Strained relationships
- Easily aroused to hostility or anger
- Job dissatisfaction or prolonged unemployment
- Depression
- Taking work home with you
- Thinking about work even relaxing
- Being a workaholic
- Trouble turning off your mind at night
- Decision-making anxiety
- Stressful dreams
- Nonstop rushing around
- Low motivation
- Pessimism
- Worrying
- Lack of control over your life
- A short-fused temper
- An unhappy home environment
- Isolation or loneliness
- Procrastination
- Panic attacks
- So impatient that you finish others' sentences
- Functioning subnormally or missing work because of drug or alcohol abuse

Section 1, Part C: Diet, Exercise, Deep Relaxation, and Lifestyle Evaluation

Select the diet that best describes your eating habits on a typical day.

1. A diet that consists of lots of fruit and vegetables (salads), whole grains, and legumes; less than 30% of all food consumed comes from fat; at least two glasses of dairy products (unless allergic) each day; low cholesterol; little sugar; more fish, turkey, and chicken than red meat.
2. Primarily consists of fast food, junk food, soda or energy drinks.
3. Meat and potatoes.
4. Protein heavy (avoiding whole grains, vegetables and fruits).
5. Vegetarian or vegan.
6. A combination of 1-2 of the choices.

Stimulants

How many stimulants drink each day? Include coffee, tea, hot chocolate, soda, and energy drinks. _____

Vitamins and Medications (include appetite suppressants and any injectables): List the name and dose.

Self-Care

1. How frequently do you practice a form of deep relaxation (such as meditation) each week?
Never: _____
Days/Week: _____ Duration: _____
2. How frequently do you participate in vigorous, nonstop aerobic activities that elevate your heart rate to your target range?

Never: _____

Days/Week: _____ Duration: _____

3. How frequently do you lift weights, perform calisthenics, or participate in any other activities that exercise your muscles?

Never: _____

Days/Week: _____ Duration: _____

Stress Assessment

What time of the day do you feel most stressed? What happens at these times (i.e., commute in traffic, children fighting at the dinner table, the daily meeting with the boss)?

The following factors are common contributors to stress. Put them in the order that you think they contribute to your stress level. Put a 1 next to the element that causes the most stress, then a 2 next to your second biggest stressor, and so on down the list.

_____ Job or lack of job

_____ Studies

_____ Family Members

_____ Social Relationships

_____ Sexual Issues

_____ Financial Issues

_____ Health

_____ Living Situation

_____ Environmental Pollution

_____ Politics (local, national policies, etc.)

_____ The world situation

_____ Other (identify this if you can)

Stress Management

List three lifestyle or behavior changes that you think may improve the quality of your life.

1. _____
2. _____
3. _____

List some ideas for coping with, or eliminating, your stressors. Include even the most bizarre alternatives that you can imagine. Don't inhibit your creativity.

1. _____
2. _____
3. _____

Use Your Results

Here is a brief overview of your answers. You can use this information to create a stress reduction plan, focusing on areas that

might help you reduce both stress and the impact of stress on your body and mind.

Section 1, Part A:

Scores:

>40 Low

40-60 Moderate

61-80 High

<80: Extremely high

Experiencing some physical stress-related symptoms or answering 1s, 2s, and 3s to the majority of questions is normal. However, if you experience a large number of physical stress symptoms or you answered 4's and 5's to a majority of the questions, you may be experiencing a high level of stress. Finding coping mechanisms is important for long term health and well-being.

Section 1, Part B:

Scores:

20-40 Low

40-60 Moderate

61-80 High

<80: Extremely high

Experiencing some psycho-social stress-related symptoms or answering 1s, 2s, and 3s to the majority of questions is normal. However, if you experience a large number of stress symptoms or you answered 4's and 5's to a majority of the questions, you may be experiencing a high level of stress. Finding coping mechanisms for these areas is important for overall health and well-being. Strategies range from meditation to therapy.

Section 1, Part D: Diet and Lifestyle Evaluation

Review this section for areas that you can use to improve how you care for your body – proper nutrition can help your body cope with the physical affects of stress as it can affect energy, mood, and healthy body weight. Stimulants and medications can also affect energy, mood, and body weight.

Reflection

- What are your triggers to stress and when are you most stressed?
- What behavior changes can you make? Knowing this can help you find strategies that will work based on your lifestyle.

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10.2: Reduce Stress in 10-Minutes

Lab 10.2

Name:

Date:

Reduce stress in 10-15 minutes

You can [reduce stress in 10-15 minutes](#) just by taking some time out to do something that is not one of your daily obligations. Try one of the following activities (**Falcone, 2022**) or do something you love that is meaningful to you:

- Get outside. Take a nature walk or city hike.
- Take a dance break!
- Write three things you are grateful for today.
- Giving back to others can help you too. Take a look at volunteer opportunities that interest you through a site such as [VolunteerMatch](#).
- Take a break from the news today... watch or listen to something fun.
- Wash your face or rinse your hands in cool water to reduce tension and calm nerves.
- Check in with a friend, family member or neighbor. Talk by phone, video chat or visit in person while maintaining proper distance and wearing masks.
- Close your eyes, take deep breaths, stretch or meditate.
- Laugh! Think of someone who makes you laugh or the last time you laughed so hard you cried.
- Channel your energy into a quick cleaning of your home.
- Exercise. Lift weights. Do push-ups or sit-ups. Kick around a soccer ball.
- Make and enjoy a cup of tea and relax in a comfortable place.
- Consider a new hobby, such as playing a musical instrument, gardening, trying a new recipe, working on a crossword puzzle or knitting.
- Connect with your faith through prayer or reach out to a member of your faith community.
- If you've been feeling overwhelmed with stress, anxiety, sadness or depressed mood, use this time to make an appointment with a counselor.
- Check in with yourself - take time to ask yourself how you are feeling.
- Curl up with a book or magazine in a comfortable place.
- Practice relaxation exercises or yoga.
- Find an inspiring song or quote and write it down (or screenshot it) so you have it nearby.

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11: CARDIOVASCULAR DISEASE, DIABETES AND CANCER

11.1: Personal Risk Assessment

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11.1: Personal Risk Assessment

What Is Your Number?

The following screening tests are used to assess a person's risk for developing cardiovascular disease.

- **What:** A blood test that measures total cholesterol, LDL “bad” cholesterol, HDL “good” cholesterol, and triglycerides (another form of fat in the blood). The test is given after a 9- to 12-hour fast.
- **Why:** To find out if you have any of the following: high blood cholesterol (high total and LDL cholesterol), low HDL cholesterol, or high triglyceride levels. All affect your risk for heart disease.
- **When:** All healthy adults should have a lipoprotein profile done at least once every 5 years. Depending on the results, your doctor may want to repeat the test more frequently.

Blood Pressure

- **What:** A simple, painless test using an inflatable arm cuff.
- **Why:** To find out if you have high blood pressure (also called hypertension) or prehypertension. Both are risk factors for heart disease.
- **When:** At least every 2 years, or more often if you have high blood pressure or prehypertension.

Fasting Plasma Glucose

- **What:** The preferred test for diagnosing diabetes. After you have fasted overnight, you will be given a blood test the following morning.
- **Why:** To find out if you have diabetes or are likely to develop the disease. Fasting plasma glucose levels of 126 mg/dL or higher in two tests on different days mean that you have diabetes. Levels between 100 and 125 mg/dL mean that you have an increased risk of developing diabetes and may have prediabetes. Diabetes is an important risk factor for heart disease and other medical disorders.
- **When:** At least every 3 years, beginning at age 45. If you have risk factors for diabetes, you should be tested at a younger age and more often.

Online Risk Calculator

If you know your cholesterol levels and your blood pressure, you can use one of the calculators linked below to assess your risk of developing cardiovascular disease:

1. [American College of Cardiology Risk Calculator](#)
2. [Framingham Heart Study Risk Calculator](#)

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12: RELATIONSHIPS, IMMUNITY, AND DISEASE PREVENTION

12.1: Developing a Personal Plan for STI Prevention

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12.1: Developing a Personal Plan for STI Prevention

Lab 12.1 Creating a Personal STI Prevention Plan

Introduction

Preventing sexually transmitted infections (STIs) requires more than just knowledge—it involves intentional decision-making, behavior change, and access to reliable resources. This activity is designed to help you reflect on your current behaviors, identify risks, and develop a realistic and personalized plan to reduce your risk of STIs. By taking a proactive approach, you can protect your health and the health of others.

Purpose

To develop a personalized, practical plan for reducing the risk of sexually transmitted infections through self-reflection, behavior change, and resource identification.

Materials

None required (Optional: access to campus or online health resources for follow-up)

Directions

Respond thoughtfully to each of the following prompts. Your answers should reflect your current knowledge, behaviors, and realistic goals for change.

Part 1: Self-Assessment

Knowledge Check

Do you consider yourself knowledgeable about sexually transmitted infections?
Explain why or why not.

Part 2: Behavior Reflection

Reducing Risk Behaviors

Identify three to five behaviors you currently engage in that may increase your risk of STIs.
What behaviors could you minimize or eliminate?

Building Protective Behaviors

Identify three to five positive behaviors you can add to your lifestyle to reduce your risk of STIs.
(Examples might include regular testing, open communication with partners, or consistent protection use.)

Part 3: Immediate Action Steps

Small Steps, Big Impact

List three specific actions you can take immediately to reduce your risk:

- 1.
- 2.
- 3.

Part 4: Barriers and Challenges

5. Identifying Obstacles

What challenges might make it difficult to follow your prevention plan?

List your top three barriers:

- 1.
- 2.
- 3.

Part 5: Problem Solving

6. Overcoming Barriers

For each obstacle listed above, provide a strategy to overcome it:

- 1.
- 2.
- 3.

Part 6: Support and Resources

7. Finding Support

- List resources you can rely on for information, support, or services:
- Friend/Partner/Family Member:
- School-Based Resource (e.g., health center, counselor):
- Community Resource (e.g., clinic, public health department):
- Other (websites, apps, hotlines):

Reflection (Optional)

Why is it important to have a personal plan for STI prevention? How might your plan evolve over time?

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13: SUBSTANCE USE AND MISUSE

13.1: Alcohol Use Survey

13.2: Addictive Behavior Checklist

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13.1: Alcohol Use Survey

Lab 13.1

Name:

Date:

Instructions

For each question, give yourself the point total that corresponds to the answer that best describes your behavior. Total your scores at the bottom and proceed to the reflection portion of the lab.

Questions	0	1	2	3	4	Answer
1. How often do you have a drink containing alcohol	Never (Skip to questions 9-10)	Monthly or less	2-4 times per month	2-3 times per week	4 or more times per week	
2. How many drinks containing alcohol do you have on a typical day when you are drinking?	1 or 2	3 or 4	5 or 6	7-9	10 or more	
3. How often do you have 6 or more drinks on one occasion?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily	
4. How often during the last year have you found that you were not able to stop drinking once you had started?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily	
5. How often during the last year have you failed to do what was normally expected of you because of drinking?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily	
6. How often during the last year have you needed a first drink in the morning to get yourself going after a heavy drinking session?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily	
7. How often during the last year have you had a feeling of guilt or remorse after drinking?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily	
8. How often during the last year have you been unable to remember what happened the night before because of your drinking?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily	
9. Have you or someone else been injured because of your drinking?	No		Yes, but not in the last year		Yes, during the last year	
10. Has a relative, friend, doctor, or other health care worker been concerned about your drinking or suggested you cut down?	No	Yes, but not in the last year			Yes, during the last year	
					Total:	

Results

A score of 8 or higher suggests a strong likelihood of harmful or hazardous alcohol use. Even with a lower score, if drinking has affected your academics, work, relationships, health, or led to legal issues, you should consider seeking help.

Briefly describe any problems you have experienced due to alcohol use:

[ActivityLines](#)

13.2: Addictive Behavior Checklist

Lab 13.2

Name:

Date:

Instructions

Think about a behavior in your life that you would like to evaluate. Many everyday activities, such as eating, exercising, gambling, shopping, playing video games, or sex, can sometimes develop into addictive patterns. Below is a list of common thoughts, feelings, and actions that may signal addiction. Read through the list carefully and check any statements that apply to your experience with the behavior you have chosen.

Behavior:

Table 13.1 Addictive Behavior Checklist

Check	Criteria
	I engage in this behavior fairly often.
	I have been engaging in this behavior for a long time.
	I engage in this behavior when I am stressed, worried, frustrated, angry, or in emotional distress.
	After engaging in this behavior, I feel bad inside; angry, guilty, or disappointed with myself.
	I sometimes feel panicky, restless, or irritable if I haven't engaged in the behavior in a while.
	I often find myself distracted from other things because I am thinking about or planning to engage in this behavior.
	I often reward myself with this behavior.
	When I engage in this behavior, I tend to lose track of time.
	I now engage in this behavior more often and/or for longer periods of time than I used to in order to get any satisfaction from it.
	I often tell myself I can stop this behavior at any time, yet I keep doing it.
	This behavior takes me away from healthier activities.
	I am often secretive about this behavior at any time, yet I keep doing it.
	This behavior often leads to problems for myself and/or others.
	I've had others tell me this behavior is not good for me.
	I've lost some friends because of my involvement with this behavior.
	My life would be better without this behavior, or if this behavior were more under control.

Results

The number of statements you mark can give you an idea of whether the behavior is becoming harmful. If your responses indicate possible concerns, it may be a good idea to reach out for support. Your school's counseling center or a qualified health professional can provide guidance. Working with an addiction specialist can help you recognize triggers, build healthier coping strategies for stress and emotions, and work toward reducing or ending the problematic behavior.

Reflecting on Your Results

Were you surprised by the outcome of Lab 13.1 or by how many “Yes” answers you gave on the addictive behavior checklist? Did your answers reflect your view of how alcohol use or other behaviors affect your life? Is there anything in the results that raises concerns for you?

Planning Your Next Steps

If the results of those tests suggest that a behavior change would be beneficial, identify your specific goal for change and outline at least three strategies you will use to achieve it.

Goal for Change:

Strategy #1

Strategy #2

Strategy #3

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 - [TitlePage - Undeclared](#)
 - [InfoPage - Undeclared](#)
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 - [3.6: Beep Test \(Lab 3.6\) - CC BY-NC-SA 4.0](#)
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 - 10.1: Personal Stress Inventory - [CC BY-NC-SA 4.0](#)
 - 10.2: Reduce Stress in 10-Minutes - [CC BY-NC-SA 4.0](#)
- 11: Cardiovascular Disease, Diabetes and Cancer - [CC BY-NC-SA 4.0](#)
 - 11.1: Personal Risk Assessment - [CC BY-NC-SA 4.0](#)
- 12: Relationships, Immunity, and Disease Prevention - [CC BY-NC-SA 4.0](#)
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 - 13.1: Alcohol Use Survey - [CC BY-NC-SA 4.0](#)
 - 13.2: Addictive Behavior Checklist - [CC BY-NC-SA 4.0](#)
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