

Ergonomic Computer Workstation

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www.allocca.com

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Configuration 1 (6" Riser)

Specifications:

Chair Height (set to lowest): 17"

Top of keyboard tray to floor: 23.5"

Top of desk to floor: 26.5"

Top of desk to bottom of monitor (riser): 6"

Top of desk to middle of monitor screen: 18.5"

Eye to screen distance: 21"

Floor to eye level: 44.5"

Personal height: 5' 7"

Personal Inseam: 29"

Parts List:

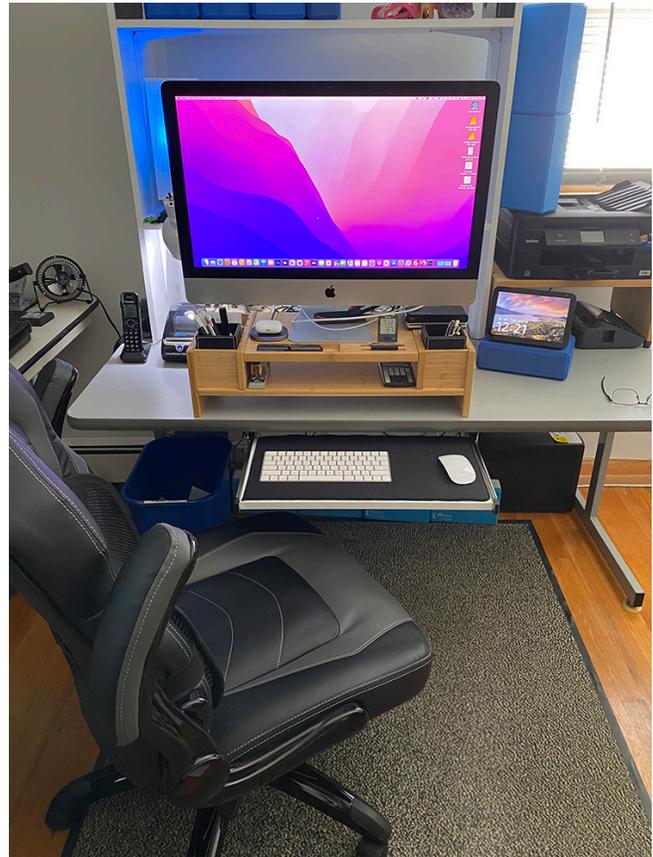
SONGMICS Bamboo 2-Tier Monitor Stand Riser with Adjustable Storage Organizer Laptop Cellphone TV Printer Stand Patented ULLD213
https://www.amazon.com/dp/B071H6SD1Z?psc=1&ref=ppx_yo2_dt_b_product_details

FRMSAET Furniture Accessories Office Product Suits Hardware 20/24/30 inches Keyboard Drawer Tray Wood Holder Under Desk Adjustable Height Platform. (20 inches, Black)
https://www.amazon.com/dp/B07QF5L7K4?psc=1&ref=ppx_yo2_dt_b_product_details

HIHUFEN Gaming Mouse Mat/Mouse Pad 23.6x11.8x0.12Inch | XXL Mouse pad | Table mat/ Large Size | Improved Precision and Speed | Rubber Base for Stable Grip on Smooth Surfaces Non-Slip (60x30Black004)
https://www.amazon.com/dp/B07T45YNFM?psc=1&ref=ppx_yo2_dt_b_product_details

Staples Emerge Vortex Bonded Leather Gaming Chair, Black and Gray (52503)
Final Price \$229.99
Item #: 2829477 | Model #: 58224-CC |
https://www.staples.com/staples-gaming-chair-black-and-grey/product_2829477

Apple 27" iMac Computer



Configuration 2 (3.75" Riser)

Specifications:

Chair Height (set to lowest): 17"
Top of keyboard tray to floor: 23.5"
Top of desk to floor: 26.5"
Top of desk to bottom of monitor (riser): 3.75"
Top of desk to middle of monitor screen: 16.25"
Eye to screen distance: 21"
Floor to eye level: 44.5"
Personal height: 5' 7"
Personal Inseam: 29"

Parts List:

Pezin & Hulin Bamboo Dual Monitor Stand Riser for Desk Organizer, Adjustable Length and Angle Multi(1/2/3) Screen Stand, Office Wood Desktop Stand Storage for Computer, Laptop, PC, Printer, Notebook - 23.6" wide or 35.5" wide.

https://www.amazon.com/dp/B08D9JFMWQ?psc=1&ref=ppx_yo2_dt_b_product_details

FRMSAET Furniture Accessories Office Product Suits Hardware 20/24/30 inches Keyboard Drawer Tray Wood Holder Under Desk Adjustable Height Platform. (20 inches, Black)
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https://www.staples.com/staples-gaming-chair-black-and-grey/product_2829477

Apple 27" iMac Computer



Configuration 3 (Laptop Riser)

Specifications:

Chair Height (set to lowest): 17"
Top of keyboard tray to floor: 24.5"
Top of table to floor: 29.5"
Top of table to bottom of monitor (riser): 9"
Top of table to middle of monitor screen: 14"
Eye to screen distance: 21"
Floor to eye level: 42.5"
Personal height: 5' 7"
Personal Inseam: 29"

Parts List:

Nulaxy Laptop Stand, Ergonomic Height Angle Adjustable Laptop Riser Holder Compatible with MacBook, Air, Pro, Dell XPS, Samsung, Alienware All Laptops 11-17", Supports Up to 44 Lbs-Silver

https://www.amazon.com/gp/product/B077B9W343/ref=ppx_yo_dt_b_search_asin_title?ie=UTF8&psc=1

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https://www.amazon.com/dp/B07QF5L7K4?psc=1&ref=ppx_yo2_dt_b_product_details

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Apple 16" Macbook Pro Computer



Homemade Desk (25" Height with 6" Riser)

Using the tray under the desk was ergonomically good. However, it made it difficult to reach many of the items on the desk such as printers. Therefore using a lower desk would allow access to those items.

It was difficult to find a desk that can go low enough. Therefore, two end tables were used in the following configuration. The end tables were 24 inches high without the top. The top of the desk was bolted to the end tables using the screw holes that were meant for the end table tops. In this configuration, an old desktop was used. There are some nice bamboo desktops available. The 6 inch rise was used. Also, a pad was used under the keyboard and mouse.

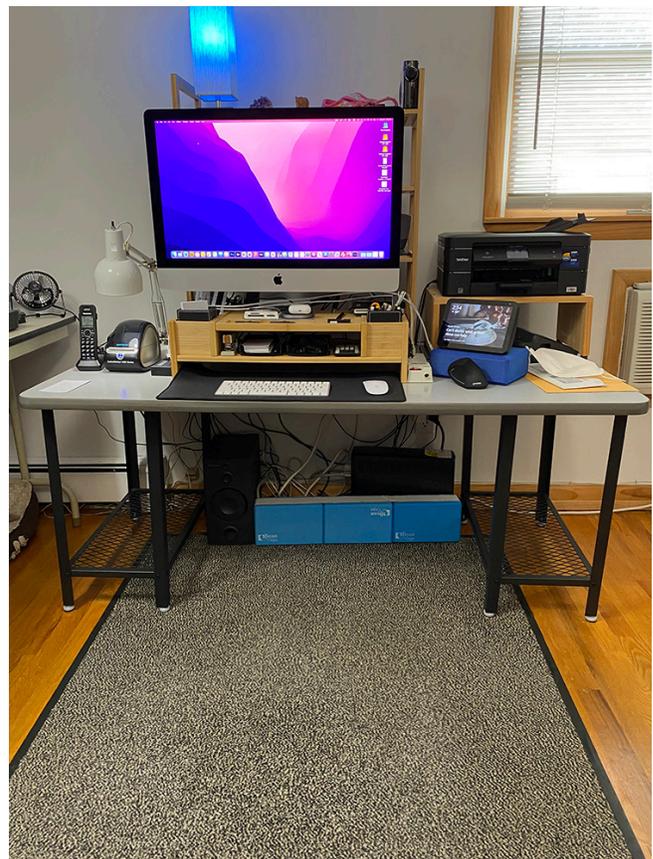
The chair was elevated so that one's thighs were almost touching the bottom of the desk.

alvorog End Side Table 2-Tier Nightstand with Storage Shelf Coffee Table Easy Assembly Wood Look Accent Furniture for Living Room Bedroom Kitchen
https://www.amazon.com/gp/product/B087CW697G/ref=ppx_yo_dt_b_asin_title_o05_s00?ie=UTF8&psc=1

SONGMICS Bamboo 2-Tier Monitor Stand Riser with Adjustable Storage Organizer Laptop Cellphone TV Printer Stand Patented ULLD213
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https://www.amazon.com/dp/B07T45YNFM?psc=1&ref=ppx_yo2_dt_b_product_details

VWINDESK 60Inch Natural Bamboo Desk Table Top Only, Matching with Electric Adjustable Standing Desk Frame, Durable, Sustainable with 80mm Grommet Holes(30" x 60" x 1") Round Angle
https://www.amazon.com/VWINDESK-Matching-Adjustable-Sustainable-Beautiful/dp/B083LLGX14/ref=sr_1_6?keywords=bamboo+desktop&qid=1638466743&s=office-products&sr=1-6



Seating Guide

Introduction

Operating a computer by sitting in one place for hours causes a plethora of skeletal, muscular, and circulatory problems. Standing in one place for hours causes other problems including making the heart and muscles pump harder to bring the blood from the legs up to the heart. Also, standing applies 100% of the vertical force to the spine. The suggested solutions herein are the result of years of trial and error. They are designed to provide a relaxed sitting position whereby the operator is reclining in a chair with the ability to rock back and forth providing movement to the muscles. It is very important to move while working. Sitting or standing in one place stiffens the muscles, decreases blood circulation, and adds pressure to the joints. The resources section lists several suggested products (not from allocca.com) merely as a guide. There are probably hundreds of products that will work equally as well.

Monitor

The monitor should be adjusted to a height whereby the center of the screen is at eye level. When the monitor is centered below eye level, the neck and back bend creating an uncomfortable and pathological posture. Yoga blocks, which are available in various sizes, can be used to adjust the height of the monitor. Other devices are also available.

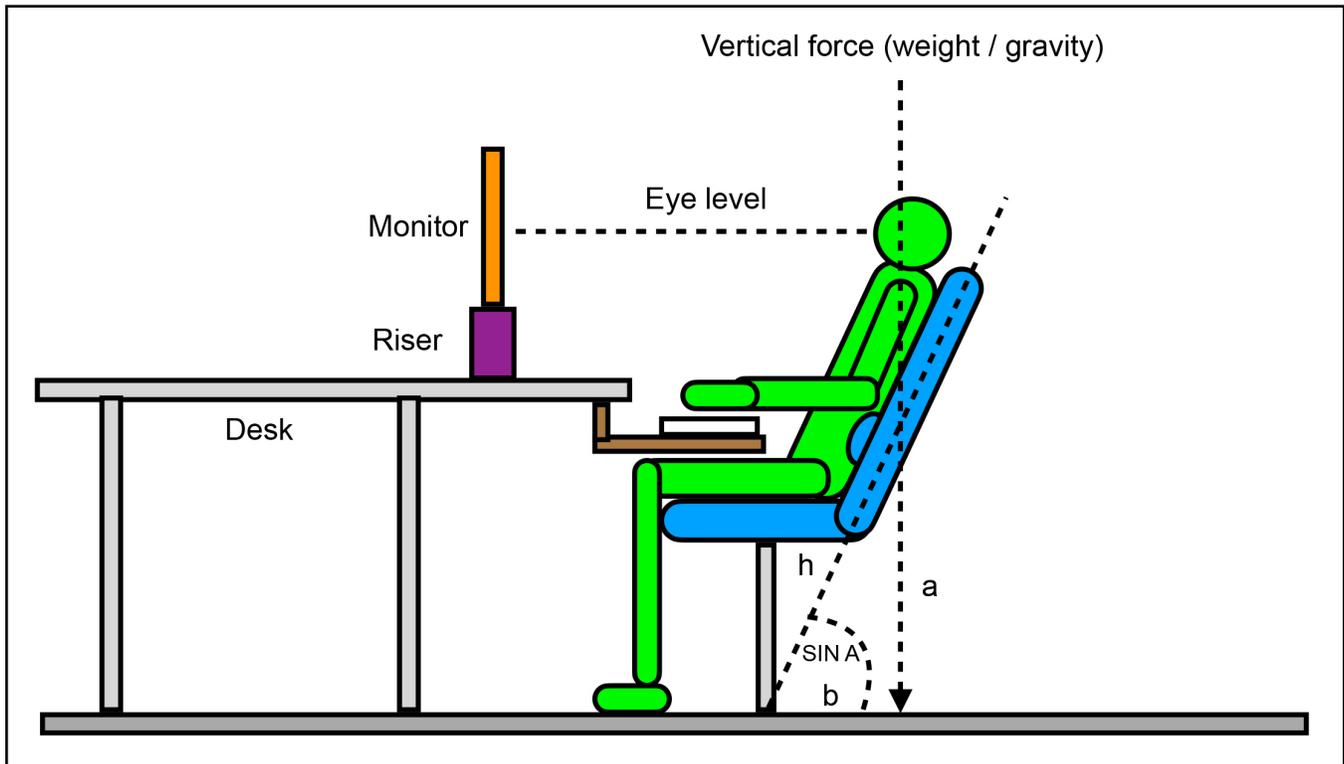
Mouse or Trackpad

To operate a mouse, one needs to hold his/her arm up while using the mouse straining the arm, shoulder, and neck. There is even a name for it, "mouse shoulder." A trackpad places less stress on the arm, shoulder, and neck because one is resting his/her wrist on the desk while moving the fingers.

Chair

Often people select a chair that is the most comfortable one in the showroom. However, after several hours of use, that chair can become painful. One must select a chair that has an adequate lumbar support and reclines. Reclining is important so that one can rock back and forth occasionally while working so that movement of the muscles can take place. A lumbar support should be adequate to support the lumbar region of the spine. Support that is too cushiony is not good. Too much lumbar support can lead to discomfort and pain. It is also advisable to purchase a chair that is either armless or that the arms are low enough to fit under the desk and keyboard tray. Reclining in a chair stimulates blood flow and relieves the pressure on the spine. Research has shown a recline angle of 135 degrees (45 degrees from vertical) with two feet on the floor is ideal and reduces spinal pressure by 74.2%. By reclining a chair only 20 degrees (from 90° to 110°) stress on the spinal discs can be reduced by 34.2%. To recline a chair, loosen the tilt knob so that the chair can easily recline. **BE SURE TO LEAN BACK AGAINST THE CHAIR! GET UP OCCASIONALLY AND WALK AROUND.**

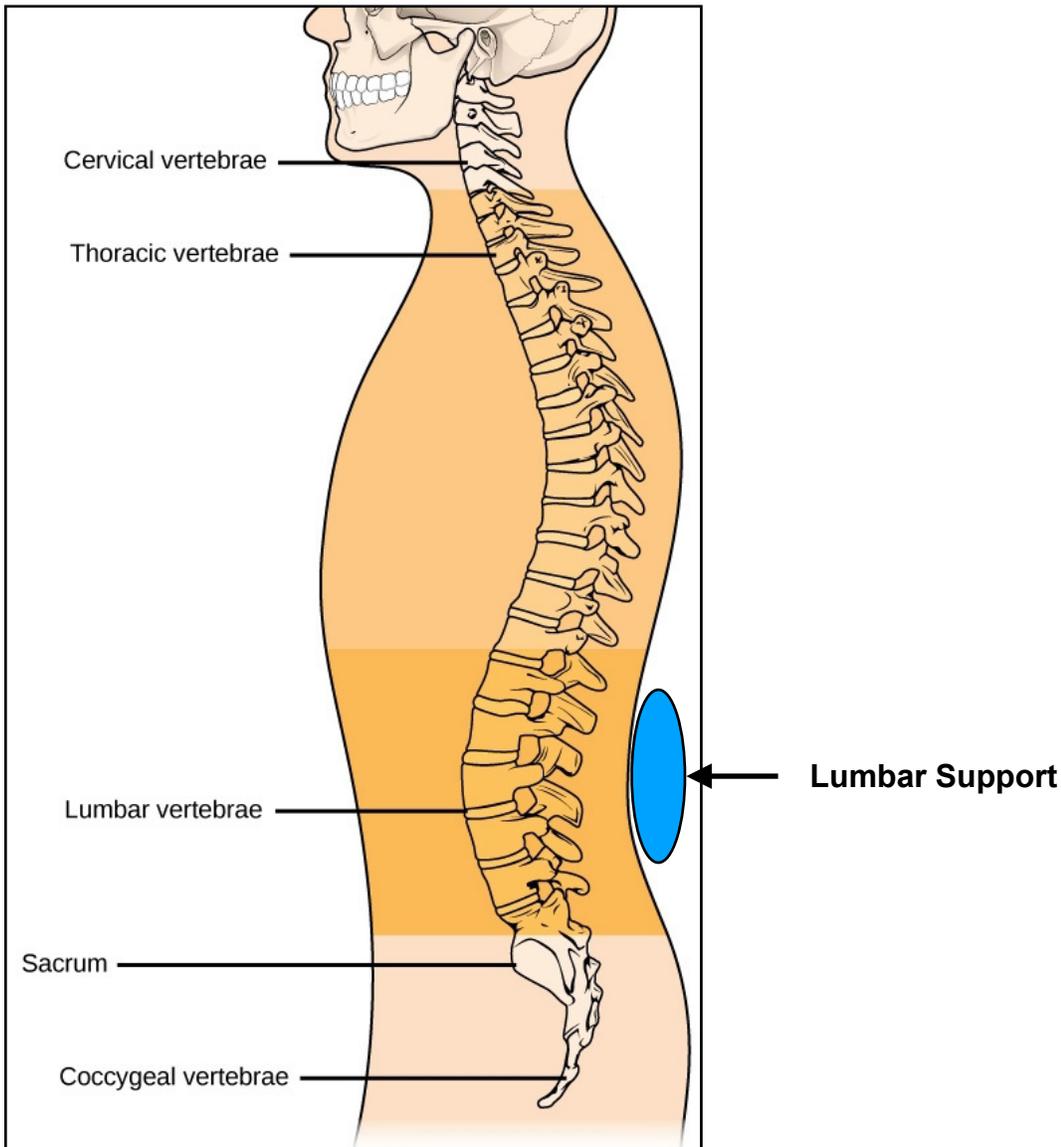
Seating Guide and Adjustments



1. Adjust the chair tilt control until the back of the chair can be tilted comfortably to approximately 115 degrees or more without exerting a substantial amount of force.
2. Adjust the height of the chair until your feet are firmly on the ground. If this is not achievable, use a foot rest.
3. Adjust the monitor so that the center of the monitor is at eye level.
4. Adjust the height of the keyboard and trackpad so that your arms are parallel to the ground. The wrists can be lower than the elbow. However, if the wrists are higher than the elbow, muscle straining can follow after long periods of time. The desk height may need to be adjusted and a keyboard tray may need to be installed to obtain the correct keyboard height.

Note: the keyboard tray width should be at least the width of the keyboard plus twice the width of the trackpad so that the keyboard can be centered with the monitor. For the Mac that would be 11 inches + 2 x 6.25 inches = 23.5 inches.

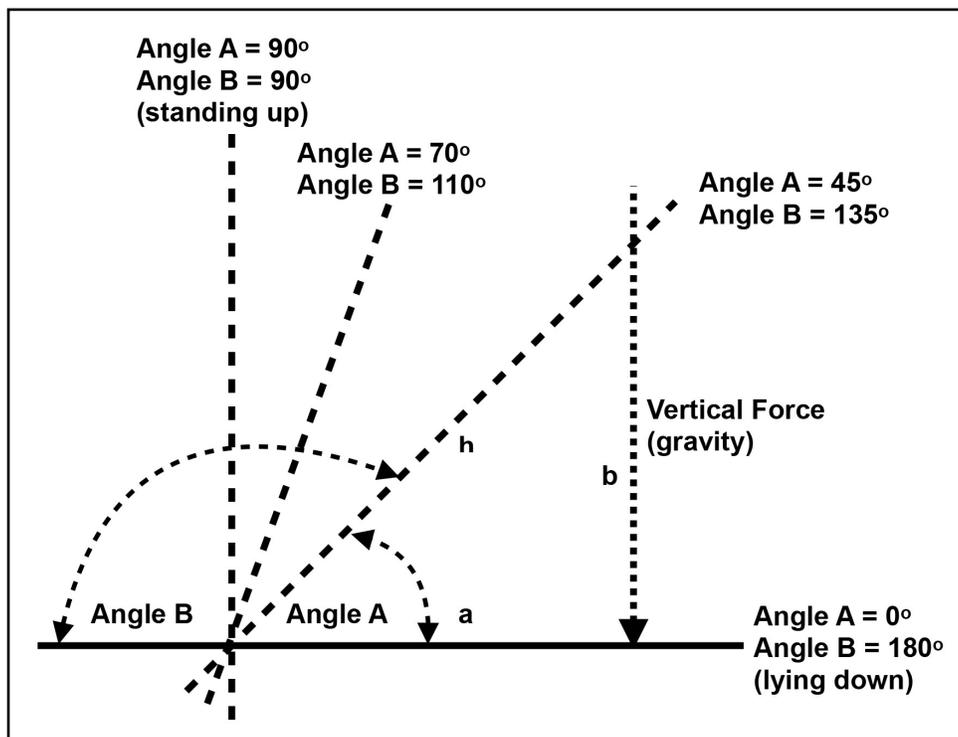
Spinal Anatomy



Automobile Seats and Headrests

It has already been established that a seat back position of 115 degrees (25 degrees from vertical) is practical and helps relieve pressure on the spine. Automobile manufacturers designed headrests assuming the seat back would be adjusted to approximately 115 degrees. If the seat back is adjusted to 90 degrees, the headrests will be in the way and maximum pressure will be exerted to the spine.

Angle vs Vertical Force (weight along the spine)



<u>Angle A</u> <u>(degrees)</u>	<u>Angle B</u> <u>(degrees)</u>	<u>Sine A</u>	<u>Applied Vertical Force to the Spine</u> <u>(%)</u>
0	180	0.000	0
5	175	0.087	8.7
10	170	0.174	17.4
15	165	0.259	25.9
20	160	0.342	34.2 (a practical angle)
25	155	0.423	42.3 (a practical angle)
30	150	0.500	50.0
35	145	0.574	57.4
40	140	0.643	64.3
45	135	0.707	70.7
50	130	0.766	76.6
55	125	0.818	81.8
60	120	0.866	86.6
65	115	0.906	90.6
70	110	0.940	94.0
75	105	0.966	96.6
80	100	0.985	98.5
85	95	0.996	99.6
90	90	1.000	100.0

Angle A is the angle from the seat back to the ground behind the chair

Angle B is the angle from the ground in front of the chair to the ground in back of the chair