


ERGONOMICS

## Structures and Mechanisms – Systems in Action – Ergonomics –

**Ergonomics** is the science of designing the job, equipment, and workplace to fit the worker. Proper ergonomic design is necessary to prevent repetitive strain injuries, which can develop over time and can lead to long-term disability. On the ergonomic figures shown below, discuss with your group what the missing ergonomic dimensions / measurements are. Once you agree, mark on the missing ergonomic dimensions / measurements you would need to collect if you were research each of the projects. The first diagram example answer is shown on first example.

1. CHAIR




The diagram opposite shows the ergonomic dimension required for working out the comfortable seating height.

2. BAR TOP



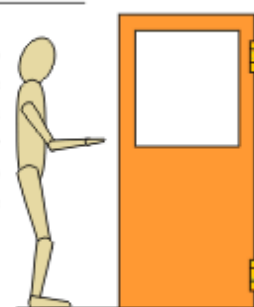
The beer drinker needs a bar on which to place his drink. Draw on the diagram the missing ergonomic dimension. Remember, the bar should be a height that enables the drinker to place his drink without spilling a drop.

3. LIBRARY SHELF



The librarian needs a shelf on which to place his books. The shelf must be at a comfortable height. There must be no 'over stretching' to place the books on a high shelf. Draw on the diagram the missing ergonomic dimension.

4. DOOR HANDLE




The person opposite needs to position a door handle on the door at the correct ergonomic height. If the handle is too low or too high it may be difficult to turn the handle. Draw on the missing ergonomic dimension

5. FOOT STOOL




The person opposite needs a footstool so that he can work at comfortably. Draw on the missing ergonomic dimension for the height of foot stool.

6. READING LAMP




The person opposite needs a reading lamp so that he can work at night. The lamp must be set at the right height. Draw on the missing ergonomic dimension for the height of the lamp.

7. COAT RAIL



Jeff needs a coat rail to hang his second-hand coat. It has not been designed yet. Draw on the diagram, the missing ergonomic measurement for its correct height.

8. STEERING WHEEL



Jeff's car does not have a steering wheel yet. Without it he will not be able to attempt his driving test again. Draw on the missing ergonomic measurement, marking its height.

Discuss as a group: Why is it important that tools, equipment, and furniture be ergonomically designed?

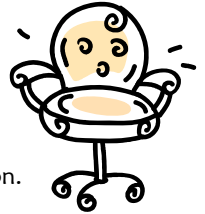


## How To Recognize Good Ergonomic Chair Design

The best ergonomic chair design is the one which provides the most support and comfort for you. While all ergonomic chairs are built to provide extra back, shoulder, neck, and wrist support, there are features you can include in your choice of an ergonomic chair design to ensure that it is the best possible purchase you can make.

### Comfort

You'll know as soon as you sit in it if the ergonomic chair design of a particular model of chair is going to be comfortable for you to work in for hours at a time. A good ergonomic chair design will conform to the contours of your back and let you move your legs at will. It will allow a minimum of one inch of space between the back of your knees and the seat, and it should have comfortable seat and back cushioning, preferably of memory foam. Perforations in the cushioning will allow for temperature-reducing air circulation.



### Adjustability and Stability

Good ergonomic chair design will include a vertically adjustable seat which allows you to recline if you choose; the adjustment controls should be easy to reach and engage. The ergonomic chair design should also provide plenty of lumbar support for your lower back. A proper ergonomic chair design will provide stability when the chair is being used yet roll and swivel with ease. And it will have comfortable cushioned arm rests which are both vertically and laterally adjustable, so that they can be moved out of the way.

### Back And Seat



One critical element of a good ergonomic chair design is the backrest. The back rest should provide adequate support to both your lower and middle back, and should be of adjustable height. It should also move forward and back, and lock at the angle of your choice. The best ergonomic chair design includes a self-adjusting backrest to ensure you have complete lumbar and thoracic back support.

The seat of a good ergonomic chair design will offer sufficient thigh support and adjustable depth so that you can increase the support to your liking. You can test the seat and all the other features of your ergonomic chair design at a retailer before you make a final decision, and you can also review the chair's instruction manual to make sure you will be comfortable with its operation.



**Your Task:** Choose of the following ideas and create an ergonomically designed chair. Your chair should be drawn to scale or built to scale using clay, toothpicks, etc. Include a brief explanation of why your chair should be purchased for its specific ergonomically designed features.

- A chair that may be carried in a backpack
- A chair with a built-in light
- A chair for the beach that protects you from the sun
- A chair for the art classroom
- A chair for you and a yellow Labrador dog to share
- A “smart” chair that may be programmed to do many things
- A chair for a 7- foot basketball player
- A chair that uses 4 shapes
- A chair that floats
- A chair that glides
- A chair that goes in a garden
- A chair that transports a person up a flight of stairs
- A chair for an important person
- A chair for a playground
- An artistic chair
- A chair that has 3 legs and works well
- A chair for bird-watching
- A chair for watching a golf tournament
- A chair for going to a concert
- A chair for working at a computer 8 hours per day
- A chair that has a storage compartment
- A chair that slides under the bed when not in use
- A chair that uses 4 materials
- A chair for a small child
- A chair with a table attached
- A throne
- A chair for carrying someone
- A chair with a dragon theme
- A chair that is more comfortable than any other chair
- A chair that has an underwater theme
- A swan chair
- A chair that is about you
- A chair for a rock star
- A chair for a swimmer, hockey players etc.