

# Ergonomics

**Unit:** Technology

**Problem Area:** Demonstrate Keyboarding Techniques

**Lesson:** Ergonomics

■ **Student Learning Objectives.** Instruction in this lesson should result in students achieving the following objectives:

- 1 Explain the broader theory of Ergonomics.**
- 2 Define common work-related incidents and illnesses.**
- 3 Explain techniques for protecting health in the workplace.**

■ **Resources.** The following resources may be useful in teaching this lesson: a

E-unit(s) corresponding to this lesson plan. CAERT, Inc. <http://www.mycaert.com>.

“Definition and Domains of Ergonomics,” *International Ergonomics Association*. Accessed November 23, 2019. <https://www.iea.cc/whats/>

“Ergonomics,” *United States Department of Labor, OSHA*. Accessed November 23, 2019. <https://www.osha.gov/SLTC/ergonomics/>

“Formulas for Calculating Rates,” Access November 27, 2019. [http://www.nmmcc.com/wp-content/uploads/FORMULAS\\_for\\_CALCULATING\\_RATES1.pdf](http://www.nmmcc.com/wp-content/uploads/FORMULAS_for_CALCULATING_RATES1.pdf)

“Injuries, Illnesses, and Fatalities,” *Bureau of Labor Statistics*. Accessed November 23, 2019. <https://www.bls.gov/iif/oshdef.htm>

“What are Ergonomic Conditions?” *Tool Box Talks, Emory University*. Accessed November 23, 2019. <http://www.ehso.emory.edu/documents/toolbox-training-ergonomics.pdf>



## ■ **Equipment, Tools, Supplies, and Facilities**

- ✓ Overhead or PowerPoint projector
- ✓ Visual(s) from accompanying master(s)
- ✓ Copies of sample test, lab sheet(s), and/or other items designed for duplication
- ✓ Materials listed on duplicated items
- ✓ Computers with printers and Internet access
- ✓ Classroom resource and reference materials
- ✓ Overhead or PowerPoint projector
- ✓ Visual(s) from accompanying masters
- ✓ Copies of sample test, lab sheet(s), and/or other designated items for duplication
- ✓ Materials listed on duplicated items
- ✓ Computers with printers and Internet access
- ✓ Classroom resource and reference materials

## ■ **Key Terms.** The following terms are presented in this lesson (shown in bold italics):

- ▶ Carpal Tunnel Syndrome
- ▶ Cognitive Ergonomics
- ▶ environmental and equipment risks
- ▶ ergonomics
- ▶ incidence rate
- ▶ musculoskeletal disorders
- ▶ occupational illness
- ▶ Organizational Ergonomics
- ▶ Physical Ergonomics
- ▶ respiratory conditions

## ■ **Interest Approach.** Use an interest approach that will prepare the students for the lesson. Teachers often develop approaches for their unique class and student situations. A possible approach is included here.

*Ask students for their definition of Ergonomics. Discuss Post Traumatic Stress Disorder and how it relates to military and police officers. Frame this as part of the broad theory of Ergonomics, that Ergonomics covers physical and mental domains.*

# CONTENT SUMMARY AND TEACHING STRATEGIES

**Objective 1:** Explain the broader theory of Ergonomics.

**Anticipated Problem:** What does the definition of Ergonomics include?

- I. This objective discusses the definition of Ergonomics. It also explains different categories of Ergonomics: physical, cognitive, and organizational ergonomics.
  - A. Ergonomics is defined by the International Ergonomics Association as helping harmonize things that interact with people at work. This includes tasks, products, jobs, equipment, and environments.
    1. **Ergonomics** is the scientific approach to harmonizing people’s needs, abilities, and limitations as they complete work tasks, work with products, perform job duties, use equipment, and work in sometimes stressful and dangerous environments.
    2. Ergonomics uses a scientific approach to making sure that people are adequately protected when they work with hazardous materials; or that people are adequately protected from musculoskeletal and vision injuries when they sit typing in front of computers for several hours a day.
  - B. Physical ergonomics focuses on working with human anatomy, physiology, and biology and includes work topics such as posture, the effects of repetitive movements, work-related muscle and skeletal stress, and managing exposure to hazardous materials. **Environmental and equipment risks** refer to what could go wrong in the work space, materials, and apparatus that workers use to perform their work tasks. **Physical Ergonomics** is the scientific approach to protecting the bodily health of workers as they interact with work environmental and equipment risks. Following are three examples of physical ergonomics.
    1. First, this area addresses issues such as how typing at work may affect posture, spinal, hand, wrist, and arm health.
    2. Second, this area addresses issues like preventing lung damage when working around hazardous air-borne materials.
    3. Third, physical ergonomics addresses issues such as how lifting and moving heavy products or equipment affects the spine and back muscles.
  - C. Cognitive ergonomics focuses on mental and psychological well-being of workers. **Cognitive Ergonomics** is the scientific approach to working with mental health, memory, and reasoning; and covers topics such as managing mental workload, stress, intensity of decision-making, fatigue or burnout. Following are two examples.
    1. First, this area works with issues related to stressful jobs like police officer, military, emergency medical physician, or therapist. These workers often see and

hear tragic events that could cause an occupational illness such as post-traumatic stress disorder “PTSD”. PTSD happens when tragic events are difficult to forget and the worker has anxiety or fear, feels like the event is happening again, and finds it difficult to function normally at times due to the distracting nature of their bad memories.

2. A second example is a job that requires high amounts of information processing or long hours of interacting with computer technology. This could happen to teachers, bankers, accountants, or financial managers. **Occupational illness** refers to conditions that come as a result of working in a specific job.
  3. The examples suggest that PTSD and high levels of stress, fatigue, and burn-out are a result of certain jobs. Cognitive ergonomics intends to find solutions to help workers stay reliable and effective, and to prevent workers from suffering occupational illnesses like in the examples.
- D. **Organizational Ergonomics** focuses on how an organization is structured; and how policies, procedures, and processes are designed to work most effectively with employee needs.
1. Organizational ergonomics often focuses on communication systems, how work is designed, supporting team work, and managing the quality of both work productivity and well-being of employees. Organizational ergonomics is concerned with the healthy design of an organization so that workers have the communication tools they need to stay connected, are arranged properly so they can interact with necessary people, and have the resources to be able to complete the work tasks.
  2. Leadership of all different kinds of organizations think about and deal with this area as they decide how to design their organizations, work systems, and purchasing equipment, software, and other resources.
- E. The United States federal government and individual state governments are involved with ergonomics. For example, the United States Department of Labor provides guidelines to help protect workers. The United States Bureau of Labor Statistics and Occupational Health and Safety Administration (OSHA) monitors and collects reports of workplace illnesses and injuries. Organizations are legally required to report work-related injuries and illnesses to OSHA.
1. **Incidence rates** are the measurements and reports of how often work-related illnesses or injuries happen. OSHA calculates incidence rate by total number of injuries (N) reported multiplied by 200,000 and then dividing that answer by total hours worked by all employees during the year (EH). The figure 200,000 represents 100 full time workers working 40 hours per week for 50 weeks. The equation is  $(N \times 200,000)/EH$ .
  2. Based on this equation, incidence rates shared with the public on the OSHA government website show how many types of injuries were reported for every 100 full time workers in an industry. This gives a percentage rate. Higher incidence rates of workplace injury range between 7 and 10; which means that 7 to 10 percent of workers experience an injury or illness—or 7 to 10 out of every 100 workers will experience an injury or illness. Examples of higher inci-

dence rates are in concrete block and brick manufacturing (7.5%) and working in a steel mill (10.2%).

3. To be considered a work-related incident, an event or exposure in the work environment has to either cause or contribute to the illness or injury, or the work environment could also significantly aggravate a pre-existing condition, according to the Bureau of Labor website definition.
4. Government keeps employers and companies accountable as much as possible by having laws and reporting systems in place. Organizations are given guidelines to follow by the government. These guidelines include the following.
  - a. organization management needs to support ergonomic goals;
  - b. involve workers in preventing illnesses or injuries;
  - c. provide necessary safety training; identify potential problems;
  - d. encourage early reporting of incidents;
  - e. implement solutions to reduce illnesses and injuries;
  - f. assess ergonomics practices and progress in the workplace.

**Teaching Strategy:** Many techniques can be used to help students master this objective. Use VM–A through D. to project key information from this learning objective. Have students visit and review the following website of the International Ergonomics Association: <https://www.iea.cc/whats/> In small groups, have students create hypothetical examples from each domain: physical, cognitive, and organizational.

**Objective 2:** Define common work-related incidents and illnesses.

**Anticipated Problem:** What are common work-related incidents and illnesses?

- II. The Bureau of Labor Statistics provides statistics of all reported illnesses and injuries on its website. It also provides much detail about which industries are reporting which types of incidents. It shows what body parts are affected, how many injuries cause workers to miss work or be transferred temporarily to another job. Based on the Bureau of Labor website, following are examples of common illnesses and injuries in the workplace.
  - A. Skin Diseases or Disorders. Exposure to chemicals, poisonous plants, or other substances can cause dermatitis, eczema, blisters, bleeding, or inflammation of the skin.
  - B. Respiratory Conditions. **Respiratory conditions** refer to lung damage resulting from a work incident. Breathing hazardous biological agents, chemicals, dust, gases, vapors, or fumes can cause toxic inhalation injury, tuberculosis, asbestosis, reactive airways dysfunction syndrome (RADS), or chronic obstructive pulmonary disease (COPD).
  - C. Musculoskeletal Disorders: **Musculoskeletal disorder** refers to damage to bone or soft tissue such as muscle caused by an incident or long-term activity at work. These types of illnesses and injuries include Carpal Tunnel Syndrome; pinched

nerve; herniated disc; sprains, strains, and tears; pain, swelling, numbness; muscle and connective tissue disorders from overexertion and repetitive motions involving work tasks.

- D. Other types of occupational illnesses are often related to the environment. Examples relating to temperature are heatstroke, sunstroke, heat exhaustion, and frostbite. Examples related to working with hazardous biological waste (bloodborne pathogenic) are HIV, hepatitis B or C, histoplasmosis, or coccidioidomycosis. Divers may develop decompression sickness. People can also develop radiation sicknesses from working around x-rays, isotopes, radium, ultra violet rays or lasers.
- E. Students spend a great deal of time interfacing with computer technology, typing papers, looking at mobile devices, or watching other types of screens. Since being a student is considered work, they must be aware of physical and cognitive ergonomic needs.
1. Musculoskeletal injuries or illnesses are often gradual, happening over a longer period of time. Since students spend much time typing, they must be aware of Carpal Tunnel Syndrome, for example. **Carpal Tunnel Syndrome** is a condition where the compression of the median nerve in the wrist causes pain, numbness, and tingling in the hand and arm. It can be caused by extended pressure on the median nerve when one is typing. Dislocated or herniated discs can occur as well in the spine. These are often caused by poor posture which can occur while typing or watching screens in a poorly postured position.
  2. Computer vision syndrome is eye stress from being too close to a screen for too long. Symptoms include headaches, red eyes, or blurred vision.
  3. Students also experience high levels of stress during rigorous academic periods of time. Students may not get enough sleep at times. This can cause burnout, fatigue, and anxiety. Like workers, students interact with technology and perform work. Students must follow suggested ergonomic practices and be aware of when they are experiencing physical or cognitive symptoms and need to make an ergonomic improvement.

**Teaching Strategy:** Many techniques can be used to help students master this objective. Use VM–E and F to present overview of information contained in this objective. Have students visit the following web resources to read more about conditions as defined by the government: <https://www.bls.gov/iif/oshdef.htm> and <https://www.osha.gov/SLTC/ergonomics/>. Have students visit this company specific web resource: <http://www.ehso.emory.edu/documents/toolbox-training-ergonomics.pdf>. Have review the following web resource for calculating incident rates: [http://www.nmmcc.com/wp-content/uploads/FORMULAS\\_for\\_CALCULATING\\_RATES1.pdf](http://www.nmmcc.com/wp-content/uploads/FORMULAS_for_CALCULATING_RATES1.pdf). Have students research the different conditions and illnesses presented in this objective and on the web resources.

**Objective 3:** Explain techniques for protecting health in the workplace.

**Anticipated Problem:** What are ergonomic techniques for protecting health in the workplace?

- III. With a focus on students, the following are techniques for protecting their health while composing at the keyboard, interacting with technology, and viewing various screens.
- A. Following are 15 techniques for protecting student health while composing at the keyboard.
1. Avoid staring at the screen (especially too closely) for long periods of time.
  2. Maintain an appropriate neck angle when viewing screens. Do not sit or lay in contorted positions that put strain on your spine and neck.
  3. Take short breaks from looking and sitting in front of computer and other screens.
  4. Change your focal point away from the screen to a more distant object periodically.
  5. Blink to keep your eyes moisturized.
  6. Keep proper lighting (environment should be brighter than the screen).
  7. Angle computer screen to avoid a glare and keep the screen clean to help with visual acuity.
  8. Arrange materials so that you can see and reach them easily without straining your eyes or arms and back.
  9. Do not sit too close to monitor.
  10. Use proper hand and wrist positioning when typing.
  11. Periodically stretch or massage your fingers and hands when typing.
  12. Use proper set-up when typing and maintain good posture and keyboarding practices.
  13. Avoid gripping mouse too tightly for long periods of time.
  14. Get up from your seat and take short walks periodically.
  15. Get up and stretch your legs, back, and arms periodically.
- B. For other work tasks and settings, there are an abundance of suggestions for maintaining health using ergonomics. Following are examples of ergonomic practices in different job settings. As you can see, ergonomics is a broad approach to helping synchronize the health of a person with the work environment. This is true for students and those in the work force. Ergonomics can help.
1. Utilize proper lifting posture when bending and lifting objectives. Use your legs more than your back.
  2. Avoid mixing chemicals when using them to clean.
  3. If you have to be on your knees for cleaning or building, use knee pads.
  4. Use team mates to help lift heavier objects rather than lifting them alone.
  5. Mix up tasks so that you are not over-exerting yourself for too long. Take breaks from working in the heat and cold weather.

6. Notify your supervisor if you are feeling mentally fatigued or too much stress or anxiety related to work.
7. Take mental health time off to balance work stress with doing enjoyable activities.

**Teaching Strategy:** Many techniques can be used to help students master this objective. Use VM–G through K to demonstrate the areas of business use. Have students write a reflective journal about how they see ergonomics relating to how they complete their school work. Have students create a personal ergonomics plan.

- **Review/Summary.** Use the student learning objectives to summarize the lesson. Have students explain the content associated with each objective. Student responses can be used in determining which objectives need to be reviewed or taught from a different angle. If a textbook is being used, questions at the ends of chapters may also be included in the Review/Summary.
- **Application.** Use the included visual master(s) and lab sheet(s) to apply the information presented in the lesson.
- **Evaluation.** Evaluation should focus on student achievement of the objectives for the lesson. Various techniques can be used, such as student performance on the application activities. A sample written test is provided.

## ■ **Answers to Sample Test: Ergonomics**

### **Part One: Matching**

1. a
2. i
3. c
4. j
5. e
6. f
7. d
8. b
9. h
10. g

### **Part Two: Multiple Choice**

1. c
2. b
3. b

4. d
5. c

**Part Three: True/False**

1. T
2. F
3. F
4. F
5. T

# Ergonomics

## ► Part One: Matching

**Instructions:** Match the term with the correct definition.

- |                                      |                              |
|--------------------------------------|------------------------------|
| a. environmental and equipment risks | f. ergonomics                |
| b. Cognitive Ergonomics              | g. Carpal Tunnel Syndrome    |
| c. occupational illness              | h. musculoskeletal disorders |
| d. respiratory condition             | i. Physical Ergonomics       |
| e. incidence rate                    | j. Organizational Ergonomics |

- \_\_\_\_\_ 1. things that could go wrong in the work space, materials, and apparatus that workers use to perform their work tasks
- \_\_\_\_\_ 2. the scientific approach to protecting the bodily health of workers as they interact with work environmental and equipment risks
- \_\_\_\_\_ 3. ailments that come as a result of working in a specific job
- \_\_\_\_\_ 4. focuses on how an organization is structured; and how policies, procedures, and processes are designed to work most effectively with employee needs
- \_\_\_\_\_ 5. the measurements and reports of how often work-related illnesses or injuries happen
- \_\_\_\_\_ 6. the scientific approach to harmonizing people's needs, abilities, and limitations as they complete work tasks, work with products, perform job duties, use equipment, and work in sometimes stressful and dangerous environments
- \_\_\_\_\_ 7. lung damage resulting from a work incident
- \_\_\_\_\_ 8. the scientific approach to working with mental health, memory, and reasoning; and covers topics such as managing mental workload, stress, intensity of decision-making, fatigue or burnout
- \_\_\_\_\_ 9. damage to bone or soft tissue such as muscle caused by an incident or long-term activity at work



\_\_\_10. a condition where the compression of the median nerve in the wrist causes pain, numbness, and tingling in the hand and arm

► **Part Two: Multiple Choice**

**Instructions: Circle the letter of the correct answer.**

1. Which of the following is an example of physical ergonomics?
  - a. Dealing with stress from working too many hours.
  - b. Developing a procedure for team work.
  - c. Dealing with curvature of the spine due to poor posture sitting in an office chair.
  - d. Developing a new information management system to help with information overload on employee memory capacity.
2. Which of the following is not a recommendation from OSHA to organizations?
  - a. Management needs to support ergonomics in the workplace.
  - b. Keep workers out of the process because it would be too overwhelming for them to participate in finding ergonomic solutions.
  - c. Encourage early reporting of incidents and illnesses.
  - d. Implement solutions to reduce incidents and illnesses.
3. Techniques for preventing physical ailments while typing at the keyboard include all except which of the following?
  - a. Avoid staring at the screen for long periods of time.
  - b. Keep the lighting in the room lower than the keyboard lighting.
  - c. Angle computer screen to avoid glare.
  - d. Use proper hand and wrist positioning when typing.
4. Which of the following is not a symptom of Carpal Tunnel Syndrome?
  - a. Numb hands
  - b. Pain in the hands
  - c. Tingling in the arms
  - d. Swollen Fingers
5. Which of the following jobs would most likely cause Post Traumatic Stress Disorder?
  - a. Editor
  - b. Bank Teller
  - c. Emergence Medical Doctor
  - d. Auto Mechanic

► **Part Three: True/False**

**Instructions: Write T for true or F for false.**

- \_\_\_\_\_ 1. As a part of ergonomics, someone working in a chemical factory would need to take steps to protect from exposure of chemicals to skin.
- \_\_\_\_\_ 2. Reporting work place incidents and illnesses to OSHA is optional for organizations.
- \_\_\_\_\_ 3. Employers are not responsible for workers working outside in the heat because the sun is natural and the organization has no control over the sun.
- \_\_\_\_\_ 4. Ergonomics is used only in the United States.
- \_\_\_\_\_ 5. Carpal Tunnel Syndrome develops over a longer period of time.

# DEFINITION AND TYPES OF ERGONOMICS

Ergonomics is the scientific approach to harmonizing people's needs, abilities, and limitations as they complete work tasks, work with products, perform job duties, use equipment, and work in sometimes stressful and dangerous environments.

- ◆ Physical Ergonomics
- ◆ Cognitive Ergonomics
- ◆ Organizational Ergonomics



# KEY DEFINITIONS

- ◆ **Environmental and equipment risks** refer to what could go wrong in the work space, materials, and apparatus that workers use to perform their work tasks.
- ◆ **Occupational illness** refers to conditions that come as a result of working in a specific job.
- ◆ **Incidence rates** are the measurements and reports of how often work-related illnesses or injuries happen.



# CALCULATING INCIDENT RATE

- ◆ OSHA collects statistics from employers:
  - # of total employee hours worked in different industries—EH
  - # of total reported incidents and illnesses—N
  - the number 200,000 represents 100 full time employees working 40 hours per week for 50 weeks per year
  - Incident rate is calculated as follows:  $(N \times 200,000)/EH$
  - The answer to the calculation represents how many people out of 100 have an incident or illness. This also translates to an overall percentage.
  
- ◆ Example: 1,000,000 hours worked, 75 reported illnesses
  - $(75 \times 200,000)/ 1,000,000$
  - $15,000,000/1,000,000$
  - = 15
  - 15 out of 100 employees (15%) reported an incident or illness (note: this is a very high incident rate!)



# OSHA GUIDELINES FOR EMPLOYERS FOR ERGONOMICS

Organizations are given guidelines to follow by the government. These guidelines include the following.

- ◆ organization management needs to support ergonomic goals;
- ◆ involve workers in preventing illnesses or injuries;
- ◆ provide necessary safety training; identify potential problems;
- ◆ encourage early reporting of incidents;
- ◆ implement solutions to reduce illnesses and injuries;
- ◆ assess ergonomics practices and progress in the workplace.



# CATEGORIES OF INCIDENTS AND ILLNESSES

- ◆ Skin Diseases and Disorders
- ◆ Respiratory Conditions
- ◆ Musculoskeletal Disorders
- ◆ Other (temperature-related, working with hazardous biological waste or radiation, etc.)



# FOR STUDENTS...

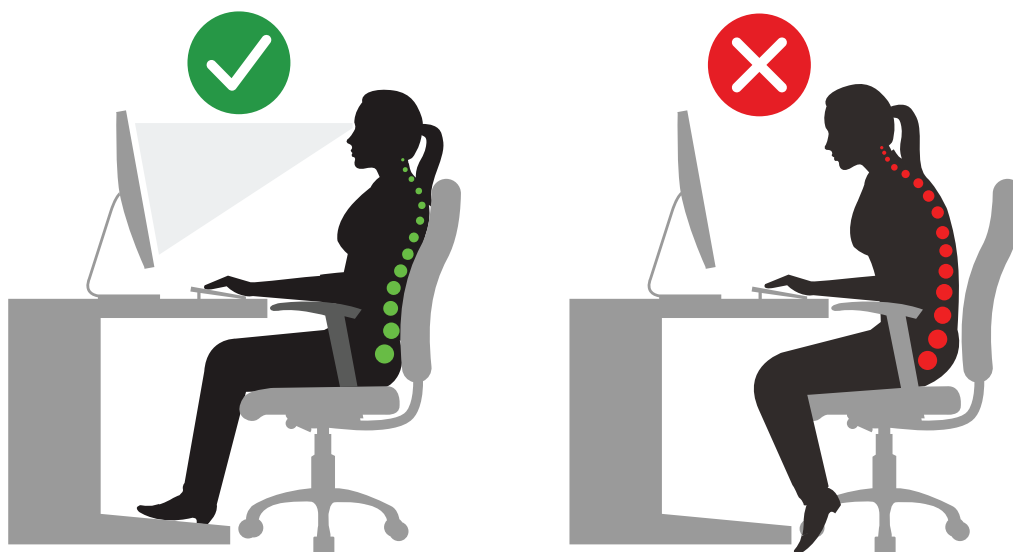
Lots of time typing and looking at screens and staying up late working can lead to some of the following conditions.

- ◆ Carpal Tunnel Syndrome
- ◆ Herniated or Dislocated Discs in the Spine
- ◆ Computer Vision Fatigue
- ◆ Burnout, Fatigue, Anxiety



# STUDENT ERGONOMIC TECHNIQUES, 1-5

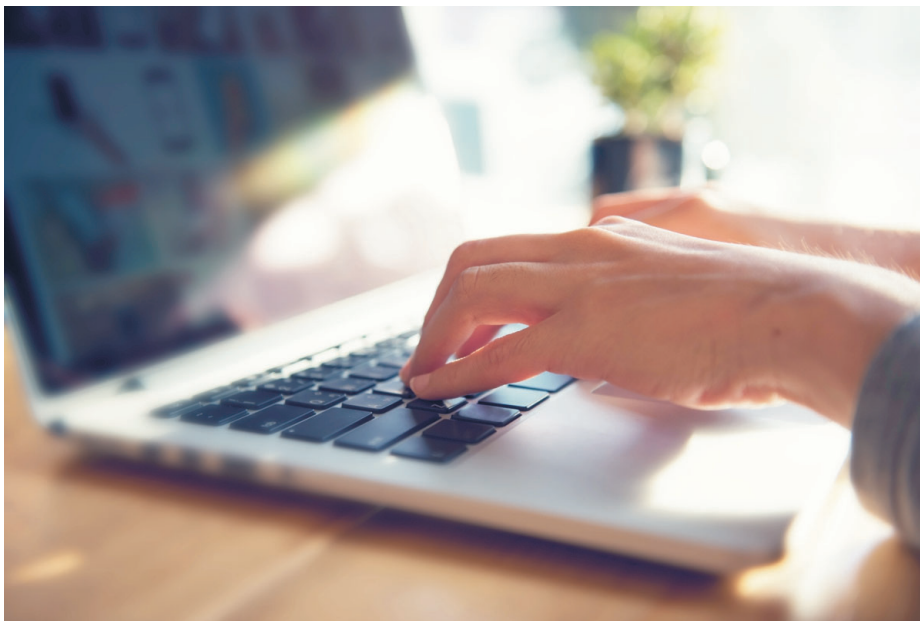
1. Avoid staring at the screen (especially too closely) for long periods of time.
2. Maintain an appropriate neck angle when viewing screens. Do not sit or lay in contorted positions that put strain on your spine and neck.
3. Take short breaks from looking and sitting in front of computer and other screens.
4. Change your focal point away from the screen to a more distant object periodically.
5. Blink to keep your eyes moisturized.



# STUDENT ERGONOMIC TECHNIQUES, 6-10

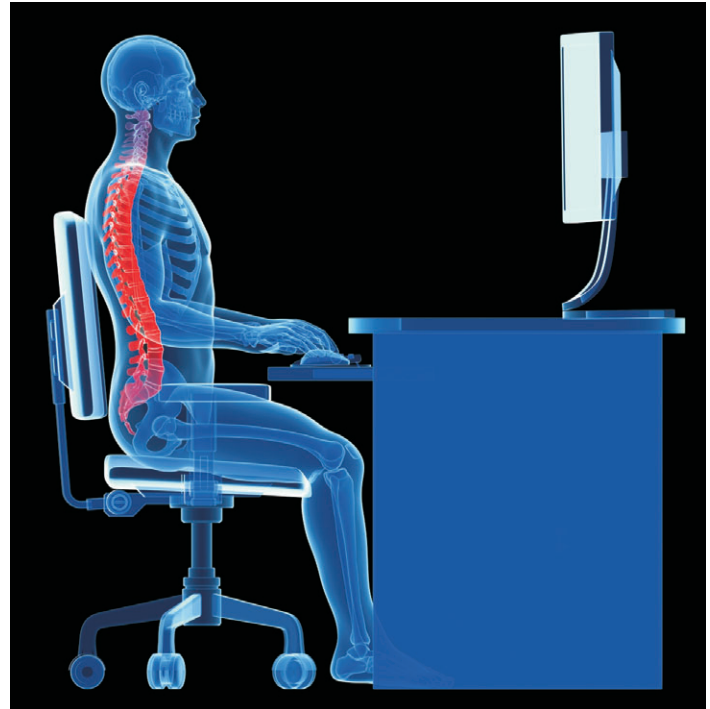
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6. Keep proper lighting (environment should be brighter than the screen).
7. Angle computer screen to avoid a glare and keep the screen clean to help with visual acuity.
8. Arrange materials so that you can see and reach them easily without straining your eyes or arms and back.
9. Do not sit too close to monitor.
10. Use proper hand and wrist positioning when typing.



# STUDENT ERGONOMICS TECHNIQUES, 11-15

11. Periodically stretch or massage your fingers and hands when typing.
12. Use proper set-up when typing and maintain good posture and keyboarding practices.
13. Avoid gripping mouse too tightly for long periods of time.
14. Get up from your seat and take short walks periodically.
15. Get up and stretch your legs, back, and arms periodically.



# EXAMPLE ERGONOMIC TECHNIQUES, PART 1

- ◆ Utilize proper lifting posture when bending and lifting objectives. Use your legs more than your back.
- ◆ Avoid mixing chemicals when using them to clean.
- ◆ If you have to be on your knees for cleaning or building, use knee pads.
- ◆ Use team mates to help lift heavier objects rather than lifting them alone.



# EXAMPLE ERGONOMIC TECHNIQUES, PART 2

- ◆ Mix up tasks so that you are not over-exerting yourself for too long. Take breaks from working in the heat and cold weather.
- ◆ Notify your supervisor if you are feeling mentally fatigued or too much stress or anxiety related to work.
- ◆ Take mental health time off to balance work stress with doing enjoyable activities.



# Ergonomics

## Objective(s)

1. To research OSHA industry injury and illness data.

## Materials

- ◆ lab sheet
- ◆ Internet-connected computer
- ◆ word processor
- ◆ OSHA database link and analysis questions provided with this lab sheet

## Procedure

1. Visit the Industry Injury and Illness Data link provided with this lab.
2. Read the Analysis Information Points.
3. Answer the analysis questions included with this lab.

“Industry Injury and Illness Data,” Bureau of Labor Statistics: [https://www.bls.gov/iif/oshwc/osh/os/summ1\\_00\\_2018.htm](https://www.bls.gov/iif/oshwc/osh/os/summ1_00_2018.htm)

## Analysis Information Points

(These points will help you understand the Bureau of Labor Statistics page. When you read these points, have the website open so you can view it.)

1. There are five main columns:
  - (1) Industry
  - (2) NAICS code



- (3) Total recordable cases
  - (4) Cases with days away from work, job restriction, or transfer
  - (5) Other recordable cases
2. Below “Cases with days away from work, job restriction, or job transfer” there are three sub-columns:
    - (a) Total
    - (b) Cases with days away from work
    - (c) Cases with days of job transfer or restriction
  3. Column (a) = (b) + (c)  
[due to rounding, column (a) may be slightly higher or lower than the sum of (b) and (c)]
  4. Column (3) = (a) + (5)  
[due to rounding, column (3) may be slightly higher or lower than the sum of (a) and (5)]
  5. Columns (b) and (c) report when workers needed to take time off work or had to restrict their work due to the injury or had to transfer to a different type of work that they could perform with the injury or illness present.
  6. Column (1) NAICS code refers to the coding system that is used to keep the different industries separate. When an organization reports, it uses the code that has been assigned to it.
  7. Column (3) Total Recordable Cases is the incident rate. This number means that out of 100 workers in the industry, this number or percentage of those workers reported an incident or illness.
  8. Most of your analysis questions focus on column (3) total recordable cases.

### Analysis Questions

1. Which industry has the NAICS code of 1129?
2. What is the incident rate for this industry?
3. How many industries in this database have an incident rate greater than 10?
4. Which industries have an incident rate greater than 10? Write these down.
5. When looking at the list of industries with an incident greater than 10, what are some of the environmental and equipment risks that you think would be a part of those jobs? What types of ergonomics practices do you think would be helpful in jobs in these industries? If you need to research jobs in these industries to get a better idea of the risks, then complete web research on these industries and jobs that fall into these industries.

# Ergonomics

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1. “Other Animal Production”
2. 8.9
3. 5
4. Steel foundries (except investment); Veterinary services, Skiing facilities, Pet Care (except veterinary) services, Nursing and residential care facilities
5. Answers should include the following.
  - a. Steel foundries (except investment)—working with melted steel which can easily burn, working with heavy machinery, working in hot conditions
  - b. Veterinary services—working with unpredictable and sick animals, working with medical equipment such as needles that can transfer germs
  - c. Skiing facilities—working on snow and hills that can be dangerous for falling, working in cold temperatures outdoors
  - d. Pet Care (except veterinary) services—working with uncooperative animals that can bite or scratch; standing on one’s feet for long periods of time; transferable germs from animals
  - e. Nursing and residential care facilities—working with biohazardous waste, working with people who may be ill or are debilitated in some way, working in a stressful environment with many regulations and demands, working long hours and experiencing fatigue and burnout