

**T.C.  
MİLLÎ EĞİTİM BAKANLIĞI**

**ENDÜSTRİYEL OTOMASYON  
TEKNOLOJİLERİ**

**TEKNİK YABANCI DİL (İNGİLİZCE) 2  
222YDK053**

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- Bu modül, mesleki ve teknik eğitim okul/kurumlarında uygulanan Çerçeve Öğretim Programlarında yer alan yeterlikleri kazandırmaya yönelik olarak öğrencilere rehberlik etmek amacıyla hazırlanmış bireysel öğrenme materyalidir.
- Millî Eğitim Bakanlığınca ücretsiz olarak verilmiştir.
- **PARA İLE SATILMAZ.**

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# DESCRIPTION

KOD	222YDK053
ALAN	Endüstriyel Otomasyon Teknolojileri
DAL/MESLEK	Ortak Alan
MODÜLÜN ADI	Teknik İngilizce 2
MODÜLÜN TANIMI	İngilizce teknik terimleri açıklayan bir modüldür.
SÜRE	40/32
ÖN KOŞUL	Teknik İngilizce-1 modülünü almış olmak
YETERLİK	Yabancı süreli yayınların çevirisini yapmak
MODÜLÜN AMACI	<p><b>Genel amaç:</b> Gerekli ortam sağlandığında bilgisayarı kullanarak, İngilizce dokümanları ve internet kaynaklarını takip edebileceksiniz.</p> <p><b>Amaçlar:</b></p> <ul style="list-style-type: none"><li>➤ İngilizce elektrik - elektronik ürün kataloglarını inceleyebileceksiniz.</li><li>➤ İngilizce mekanik ürün kataloglarını inceleyebileceksiniz.</li><li>➤ İngilizce bilgisayar program sayfalarını inceleyebileceksiniz.</li></ul>
EĞİTİM ÖĞRETİM ORTAMLARI VE DONANIMLARI	Ortam: Sınıf Donanım: Bilgisayar, projeksiyon cihazı
ÖLÇME VE DEĞERLENDİRME	Her faaliyetin sonunda ölçme soruları ile öğrenme düzeyinizi ölçeceksiniz. Araştırmalarla, grup çalışmaları ve bireysel çalışmalarla öğretmen rehberliğinde ölçme ve değerlendirmeyi gerçekleştirebileceksiniz



# INTRODUCTION

**Dear Student,**

One of the most considerable reasons why the humanity advance is production and so research and development. The countries which is paying more money from their incomes to RESEARCH&IMPROVEMENT is getting an easier and more comfortable life style. Because The countries which don't renew their technology become underdeveloped day by day.

New technology developes thanks to foreign language and the one who knows foreign language. Hardworking people can read the magazines, books and internet documents in English so can follow the recent technology on their own branches or jobs by learning foreign languages and technical foreign languages. They broad their mind. So they can be more effective and useful people for their counrty. Lazy people can't follow the recent technology since they don't have enough foreign language. So they are blocked in their factories or workshops.

We have aimed to improve your occupational English into a higher level with the module "Technical English 2". In this case, you can learn the technical words and terms in English and follow the recent technology in the world more closely.



# LEARNING ACTIVITY-1

## AIM

- You will be able to examine product catalogues.

## SEARCH

- Study the word structures and tenses in English before Technical English Class.

## 1.MECHANICS

### 1.1. Simple Machines

- **THE WHEEL AND AXLE:** The wheel and axle (axle) make it easier to move heavy loads. A wheel is a disc- or torus- shaped object, the fundamental operation of which is to transfer linear motion into rotary motion.
  - Wheelbarrow.
  - Wagons and carts.
- **THE LEVER:** The lever magnifies force or velocity. It is often used to move heavy loads with less effort. It is a rigid object that is used with an appropriate fulcrum or pivot point to multiply the mechanical force that can be applied to another object.
  - Crowbar, Nutcrackers.
  - Hammer and nail clippers.
  - Shovel, seesaw, elbow.
- **THE PULLEY:** The pulley is one or more wheels on axles, with a rope going over each wheel. It makes it easier to lift heavy loads. It is a wheel with a groove along its edge, for holding a rope or cable.
  - Hoist the flag.
  - Crane.
- **THE SCREW:** A screw is an inclined plane wrapped around a pole which holds things together or lifts materials. Screws are used to fasten two objects together. A screwdriver is a tool for driving (turning) screws; screwdrivers have a tip that fits into the head of a screw.
  - Jar lid, vise.
  - Bolt, drill, nut.
  - The Wedge

---

A wedge is a simple machine shaped like an inclined plane. A wedge is actually like a moving inclined plane. An easy way to see how a wedge works is to think of it as an inclined plane standing on its narrow end. A fairly weak force, applied to the wide end of a wedge whose narrow end is being pushed into something, will send a strong force pushing out at the sides. An example would be to take a wedge of steel and bang it into the end of a log, the log will split open. We can use the wedge action to cut and shape ice and wood sculptures, clay or whatever.

- Knife, pin, nail.
- Front of a boat.
- The Inclined Plane

The inclined plane makes it easier to raise heavy loads. It is a ramp that reduces the force necessary to overcome the force of gravity when changing the elevation of mass.

- Wheelchair ramps.
- Loading ramps (e.g. into removals vans).
- Slide, stairs, escalator, slope.

➤ Self Study 1

Match the words with the pictures given below.

SCREWDRIVER

SCREW

BOLT -NUT

PULLEY

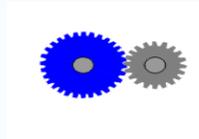
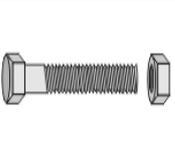
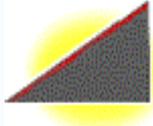
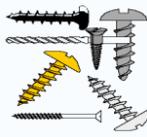
WHEEL-AXLE

LEVER

INCLINED-PLANE

GEAR

WISE



➤ Related Words:

• Nouns:

<b>Bolt</b>	: Cıvata
<b>Cart</b>	: El arabası.
<b>Crane</b>	: İş makinesi, vinç.
<b>Crowbar</b>	: Levye, kaldıraç, manivela.
<b>Drill</b>	: Matkap.
<b>Edge</b>	: 1- Kenar, ağız, kıyı 2- Keskinlik, şiddet 3- Kesit 4- Üstünlük.
<b>Fulcrum</b>	: Dayanak, dayanma noktası, destek noktası.
<b>Groove</b>	: 1- Oluk, çizgi 2- Adet, gelenek 3- Mükemmel şey, harika şey.
<b>Log</b>	: Kütük, tomruk.

<b>Nail</b>	: Çivi, tırnak.
<b>Nut</b>	: Somun
<b>Pivot</b>	: Eksen, Mil
<b>Removal</b>	: 1- Taşıma, nakil, yer değiştirme, ortadan kaldırma 2- Görevden alınma.
<b>Rigid</b>	: Sert, katı, eğilmez, kaskatı, dimdik, sabit, esnemez, kesin, dik kafalı.
<b>Rotary</b>	: Bir eksen etrafında dönen.
<b>Sculpture</b>	: Heykel
<b>Shovel</b>	: Kürek, faraş, kepçe.
<b>Torus</b>	: Halka [mak.], halka şeklinde kabartma, yumru.
<b>Vise</b>	: Mengene
<b>Wheel-barrow</b>	: El Arabası

- Verbs:

<b>Bang</b>	: Vurmak, çarpmak
<b>Fasten</b>	: Bağlamak; tutturmak; bağlanmak.
<b>Fit</b>	: Uymak, oturmak, yakıştırmak, yakışmak.
<b>Hoist</b>	: 1- Kaldırmak, kaldıraç 2- Yukarı çekmek
<b>Magnify</b>	: Büyütmek, abartmak, göklere çıkarmak, övmek.
<b>Overcome</b>	: -in üstesinden gelmek; -i yenmek.
<b>Split</b>	: Yarmak, paylaştırmak, bölüştürmek, bölmek, parçalamak, ayırmak.
<b>Wrap</b>	: Sarmak, dolamak.

➤ Self study 2

**Left to Right**

- 1- Metal bar with a flattened end used for loosening / Block of wood.
- 3- One who is between 13 and 19 years of age.
- 5- Pack; bind; enclose / roundish object produced by certain female animals for reproductive purposes.
- 6- Line where two surfaces meet
- 7- Machine for hoisting heavy materials.

**Up to Down**

- 2- Occurring around a central axis; spinning around an axis.
- 4- Pain, deep sorrow/ prep. for each; by means of, via; through.
- 6- Reduce, decrease, lessen; become less.
- 8- Something which causes division or an opening and it has triangle shape.
- 11- Long narrow channel.

	1	2	3	4	5	6	7	8	9	10	11
1	C	R	O	W	B	A	R				
2						B					
3						A					
4						T					
5						E					
6											
7											

## 1.2. Machining

Machining is the process of making or producing something by using a machine without hand finishing or hand processing. Machined articles are called workpieces.

There are several processes in machining such as turning, milling, drilling, shaping, sawing, grinding, and so on. The turning process is a method of producing a cylindrical workpiece. A lathe is used for this process. Lathes are used in woodturning, metalworking, metal spinning, and glassworking. Lathes can be used to shape pottery, the most well known design being the potter's wheel. Most suitably equipped metalworking lathes can also be used to produce most solids of revolution, plane surfaces and screw threads or helicals.

As the pieces of metal to be machined is rotated in the lathe, a cutting tool is advanced radially into the workpiece to a specified depth and moved longitudinally along the axis of the workpiece, removing metal in the form of chips. Both inside and outside surfaces can be machined on a lathe.

By using attachments, other operations such as drilling, reaming, taper turning, screw cutting and grinding may be performed.

A milling machine is a power-driven machine used for the complex shaping of metal (or possibly other materials) parts. Its basic form is that of a rotating cutter or end mill which rotates about the spindle axis (similar to a drill), and a movable table to which the workpiece is affixed. That is to say the cutting tool generally remains stationary (except for its rotation) while the workpiece moves to accomplish the cutting action. Milling machines may be operated manually or under computer numerical control (see CNC). Milling machines can perform a vast number of complex operations, such as slot cutting, planning, rebating, drilling, etc...

A milling machine is used for the milling process that machines flat and angular surfaces. This milling process is a method of removing material with a rotating multiple-pointed cutting tool called a milling cutter. Under normal circumstances, the workpiece is fed to the rotating cutter.

The milling machine is used to drill, bore holes, cut gear teeth, and do specialized work for which it can be adapted.

- Related Words:

- Nouns:

<b>Chip</b>	: Talaş
<b>End Mill</b>	: Parmak Freze Bıçağı
<b>Grinding</b>	: Taşlama, bileme
<b>Metal spinning</b>	: Metal Sıvama
<b>Milling cutter</b>	: Freze Bıçağı
<b>Planning</b>	: Düzlem yüzeyden talaş kaldırma
<b>Pottery</b>	: Çömlekçilik
<b>Rebating</b>	: Kademeli Frezeleme, oluk açma
<b>Reaming</b>	: Raybalama, delik açmak, deliği genişletmek.
<b>Screw cutting</b>	: Vida Açma
<b>Slot Cutting</b>	: Yarık Açma
<b>Screw thread</b>	: Vida dişi
<b>Taper turning</b>	: Konik Tornalama

- Verbs:

<b>Accomplish</b>	: Başarıyla sonuçlandırmak
<b>Advance</b>	: İlerlemek, ilerletmek
<b>Equip</b>	: Donatmak, teçhiz etmek
<b>Machine</b>	: Makine ile imal etmek
<b>Milling</b>	: Frezeleme
<b>Milling machine</b>	: Freze makinesi.
<b>Perform</b>	: Yapmak, yerine getirmek
<b>Workpiece</b>	: İşlenecek Parça

- Adjectives:

<b>Affixed</b>	: Eklenmiş, takılı
<b>Angular</b>	: Köşeli, açılı
<b>Power-driven</b>	: Motorla sürülen
<b>Stationary</b>	: Sabit, durağan
<b>Several</b>	: Birkaç, bit takım, çeşitli
<b>Vast</b>	: Çok büyük

- Adverbs:

<b>Longitudinally</b>	: Uzunlamasına, boyuna
<b>Radially</b>	: Merkezden çevreye doğru düzenlenmiş
<b>That is to say</b>	: Bir başka deyişle

➤ Self study 3

• Match the words

- |                 |                |     |
|-----------------|----------------|-----|
| 1. Accomplish   | Attach         | ( ) |
| 2. Stationary   | Enlarge a hole | ( ) |
| 3. Affix        | Carry Out      | ( ) |
| 4. Vast         | Bore           | ( ) |
| 5. Circumstance | Occasion       | ( ) |
| 6. Ream         | Various        | ( ) |
| 7. Drill        | Enormous       | ( ) |
| 8. Perform      | Achieve        | ( ) |
| 9. Adapt        | Steady         | ( ) |
| 10. Several     | Adjust         | ( ) |

### 1.3. Classification Of Machining Methods, and Cutting

How to finish a material to a desired shape and to a desired size, that is, processing or machining. Machining is roughly classified, in the following three categories:

- Deformation Method: Such processing as casting, forging.
- Deposition Method: Such processing as welding, bonding, press-fitting, plating.
- Removal Method: Cutting a variety of metals.

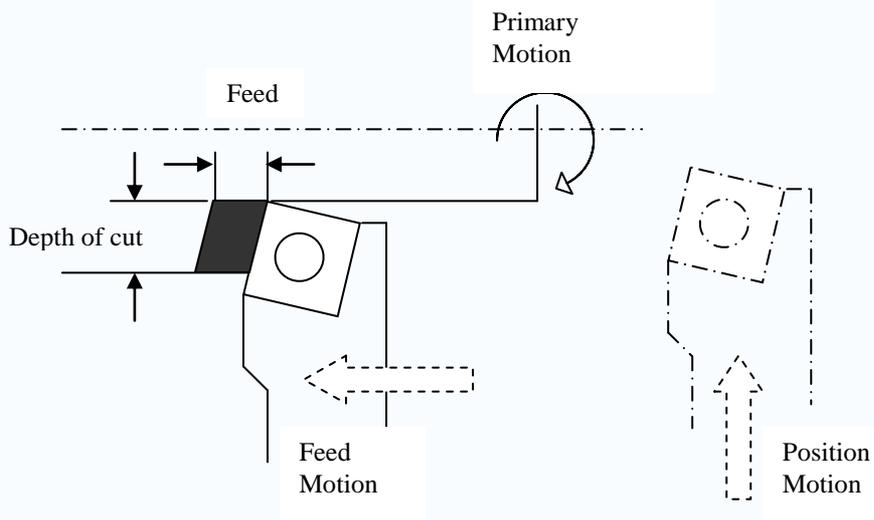
Cutting is to remove unnecessary portions from a material. It is classified, therefore, as one of the removal methods. Abrasive machining with grindstone and/or abrasive grain applied (which is generally called “grinding”). In the narrower sense, therefore, abrasive machining may be also deemed as one of the removal processes in addition to cutting by the use of a cutting tool or milling cutter. Therefore, cutting methods may be classified as follows:

- Single Point Tool : Turning, boring, planing, etc.
- Multi Point Tool : Milling, drilling, reaming, etc.

- Three Conditions of Cutting:

A machine tool has three cutting motions, that is, primary motion, feed motion and positioning motion. To do an operation of cutting with lathe, these relative motions are adjusted between a tool and a work material by setting their respective conditions as follows.

- **Primary Motion:** A rotary (or linear) motion of a tool or a work material. This is equivalent to a turning motion of the spindle on a lathe. A lathe has this motion in the form of the spindle’s turn. It’s set as the spindle motor speed per unit time. The spindle motor speed, however, cannot be obtained straightforwardly. In the other words, a material has a cutting speed dependent upon its diameter.
- **Feed Motion:** A motion of giving an extension to a material on the surface machined by moving a tool at a constant stroke.
- **Position Motion:** Motion in which a tool (or cut material) is positioned to cut in. Generally, it relates to the motion for setting a depth of cut.



**Figure 1.1: Cutting direction on machine**

➤ **Related Words:**

• **Nouns:**

<b>Extension</b>	: 1-Uzatma, ek. 2- Dahili telefon hattı
<b>Grindstone</b>	: Bileytaşı
<b>Grain</b>	: Tane
<b>Lapping</b>	: Alıştırma.
<b>Lathe</b>	: Torna, torna tezgahı.
<b>Mill</b>	: Fabrika-Değirmen
<b>Portion</b>	: Parça, bölüm.
<b>Spindle</b>	: Mil, eksen.
<b>Stroke</b>	: Çarpma, darbe, vuruş.

• **Verbs**

<b>Adapt for</b>	: 1- Uyarlamak, adapte etmek. 2- Alışmak, intibak etmek.
<b>Bond</b>	: Tutturmak, yapıştırmak, bağlamak.
<b>Bore</b>	: Delmek, delik açmak.
<b>Cast</b>	: Dökme, döküm, kalıba dökme.
<b>Classify</b>	: Sınıflandırmak
<b>Cut in</b>	: 1- Kesmek 2- Birinin sözünü kesmek, araya girmek.
<b>Deem</b>	: Farzetmek, varsaymak, zannetmek; inanmak; dikkate almak.

<b>Forge</b>	: Demir dövme, dövme, işleme, düzenleme, biçim vermek.
<b>Grind</b>	: Bileme, öğütme, ezme, zımparalama
<b>Mold</b>	: Kalıba dökmek, kalıba sokmak.
<b>Obtain</b>	: Elde etmek, edinme, sağlama.
<b>Plane</b>	: Düzleme, düzeltme, rendeleme.
<b>Plate</b>	: Kaplama.
<b>Weld</b>	: Kaynak yapma, leğimleme.

- Adjectives:

<b>Abrasive</b>	: 1- Aşındırıcı 2- Aşındırıcı madde (Zımpara vb.)
<b>Constant</b>	: Sabit, değişmez, kararlı
<b>Equivalent</b>	: Eşdeğer, denk
<b>Grindstone</b>	: Bileme Taşı.
<b>Respective</b>	: Kendi

- Adverbs:

<b>Roughly</b>	: Kabaca, yaklaşık olarak
<b>Straightforwardly</b>	: Açıkça

## 1.4.Lathe Related Operations

The lathe, of course, is the basic turning machine. Apart from turning, several other operations can also be performed on a lathe.

- **Boring:** Boring always involves the enlarging of an existing hole, which may have been made by a drill or may be the result of a core in a casting. An equally important, and concurrent, purpose of boring may be to make the hole concentric with the axis of rotation of the workpiece and thus correct any eccentricity that may have resulted from the drill's having drifted off the center line. Concentricity is an important attribute of bored holes. When boring is done in a lathe, the work usually is held in a chuck or on a face plate. Holes may be bored straight, tapered, or to irregular contours. Boring is essentially internal turning while feeding the tool parallel to the rotation axis of the workpiece.
- **Facing:** Facing is the producing of a flat surface as the result of a tool's being fed across the end of the rotating workpiece. Unless the work is held on a mandrel, if both ends of the work are to be faced, it must be turned end, after the first end is completed and the facing operation repeated. The cutting speed should be determined from the largest diameter of the surface to be faced. Facing may be done either from the outside inward or from the center outward. The point of the tool must be set exactly at the height of the center of rotation. Because the cutting force tends to push the tool away from the work, it is

usually desirable to clamp the carriage to the lathe bed during each facing cut to prevent it from moving slightly and thus producing a surface that is not flat. In the facing of casting or other materials that have a hard surface, the depth of the first cut should be sufficient to penetrate the hard material to avoid excessive tool wear.

- **Parting:** Parting is the operation by which one section of a workpiece is removed from the remainder by means of a cutoff tool. Because cutting tools are quite thin and must have considerable overhang, this process is less accurate and more difficult. The tool should be set exactly at the height of the axis of rotation, be kept sharp, have proper clearance angles, and be fed into the workpiece at a proper and uniform feed rate.
- **Threading:** Lathe provided the first method for cutting threads by machines. Although most threads are now produced by other methods, lathes still provide the most versatile and fundamentally simple method. Consequently, they often are used for cutting threads on special workpieces where the configuration or nonstandard size does not permit them to be made by less costly methods. There are two basic requirements for thread cutting. An accurately shaped and properly mounted tool is needed because thread cutting is a form-cutting operation. The resulting thread profile is determined by the shape of the tool and its position relative to the workpiece. The second by requirement is that the tool must move longitudinally in a specific relationship to the rotation of the workpiece, because this determines the lead of the thread. This requirement is met through the use of the lead screw and the split unit, which provide positive motion of the carriage relative to the rotation of the spindle.

### Related Words:

#### Nouns:

<b>Boring</b>	: Delik Delme
<b>Chuck</b>	: Torna Aynası
<b>Clearance</b>	: Ara, açıklık
<b>Contour</b>	: Tesviye Hattı, dış çizgiler
<b>Core</b>	: Çekirdek, Bir şeyin en önemli yeri
<b>Cutoff tool</b>	: Kesme aleti
<b>Facing</b>	: Alın Tornalama
<b>Feed Rate</b>	: İlerleme miktarı
<b>Eccentricity</b>	: Dışmerkezlilik
<b>Lead of thread</b>	: Vida dişi
<b>Lead screw</b>	: Vida açma mili
<b>Mandrel</b>	: Torna punto yada matkap başlığı
<b>Parting</b>	: Silindirik Tornalama
<b>Threading</b>	: Diş açma, Vida açma
<b>Wear</b>	: Yıpranma, aşınma

### Verbs:

<b>Avoid</b>	: Sakınmak, çekinmek
<b>Clamp</b>	: Sıkıştırmak, kavramak
<b>Drift</b>	: Sürüklemek
<b>Overhang</b>	: Sarkmak, çıkıntı
<b>Penetrate</b>	: Nüfuz etmek, tesir etmek, girmek
<b>Tend to</b>	: Eğilimli olmak, yönelmek
<b>Involve</b>	: İçermek, kapsamak, gerektirmek

### Adjective:

<b>Concurrent</b>	1) Uyuşan, aynı anda oluşan 2) Raslantısal, tesadüfi
<b>Concentric</b>	: Eşmerkezli
<b>Excessive</b>	: Aşırı
<b>Irregular</b>	: Düzensiz, kurlsız
<b>Relative</b>	: 1) Bağlı, ilişkin 2) Göreli, Oranlı
<b>Versatile</b>	: Çok yönlü

### Adverb:

<b>Consequently</b>	: Sonuç olarak
<b>Essentially</b>	: Aslında, gerçekte
<b>By means of</b>	: Yoluyla, vasıtasıyla

**Self Study 3** Match the words below with the synonymes.

<b>Blunt</b>	<b>Irregular</b>	<b>Eccentric</b>	<b>Proper Insufficient</b>
Concentric	X	.....	
Inappropriate	X	.....	
Irregular	X	.....	
Sharp	X	.....	
Excessive	X	.....	

## 1.5. Setting Cutting Conditions

Described herein is how to set three cutting conditions, i.e. cutting speed, feed and depth of cut. Appropriate cutting conditions are an important factor, which will directly affect the cutting efficiency, cutting resistance, cutting power, tool life, processing accuracy and so on. It is no exaggeration to say that an ability to appropriately set cutting conditions is essential to the machining worker.

### 1.5.1. Cutting Speed

The term, cutting speed, means the rate at which a tool is cutting a material. Based on this cutting speed, we may obtain a spindle motor speed. To take this calculation, a formula may be expressed as follows:

$$V = \frac{\pi \times D \times N}{1000}$$

V: Cutting Speed (m/min)  
N: Spindle motor speed (min<sup>-1</sup>)  
D: Work material diameter (mm)

#### Standart Speeds for Cutting Steel Materials

<u>TOOL</u>	<u>Standart Cutting Speed (m/min)</u>
High Speed Steel	20-30
Cermet	120 – 150

To determine the spindle motor speed, it is primarily necessary to determine the magnitude of cutting speed. According to type of tool or material to be machined, however, an applicable standart cutting speed is automatically determined.

### 1.5.2. Feed

To give an extension to a material on the surface in the process of cutting, it is necessary to move a tool rectangularly to the material in its turning direction. This is the feed motion, which may be given as a magnitude of feed per turn of the work material. Generally, a magnitude of feed is indicated in symbol f. On an NC lathe, meanwhile, feed f may be specified as a stroke of motion per minute, that is, feedrate.

### 1.5.3. Depth of Cut

The term, depth of cut, means the stroke at which a tool bites into a work material. The sectional area of a chip is dependent upon feed and depth of cut. Generally, the magnitude of a depth of cut is indicated in symbol t. On a lathe, meanwhile, depth of cut t is given as a value of diameter. An example of depth of cut Expression t= 5 mm. (In this case, the stroke at which the tool bites into the material is 2.5 mm.)

A larger depth of cut is given in finish cutting and a smaller depth of cut (standart 3 thru 5) in rough cutting. It should be noted, however, that too small a depth of cut would cause the cutting tool to slip. And it might lead to a shorter tool life and/or to a degradation of surface finish quality. The upper limit of a depth of cut, moreover, should be determined, judging from the relation with a power requirement for cutting as well as a feed and cutting speed.

## Related Words:

### Nouns:

<b>Accuracy</b>	: Doğruluk, kesinlik, tamlık.
<b>Cermet</b>	: Cer(amic) + met(al)
<b>Degradation</b>	: Bozulma, yıkılma.
<b>Exaggeration</b>	: Abartma, abartı.
<b>Feed</b>	: Besleme.
<b>Slip</b>	: Kayma.
<b>Stroke</b>	: Çarpma, vuruş, darbe, başarı.

### Adjectives:

<b>Applicable</b>	: Uygun, uygulanabilir.
<b>Appropriate</b>	: Uygun
<b>Essential</b>	: Gerekli, şart, baslica.

### Verbs:

<b>Suppose</b>	: Zannetmek, sanmak, varsaymak.
<b>Judging from</b>	: -e göre kara vermek, -den sonuç çıkarmak.

### Conjunctions:

<b>Herein</b>	: Bunda, bu yazının içinde.
<b>Meanwhile</b>	: Bu arada, aynı anda, iken.
<b>Thru</b>	: -e kadar.

## 1.6. An Industrial Robot

What is robot? “A robot is a machine which can be programmed to perform some tasks which involve manipulative functions under automatic control.” A robot is a kind of automatic machine which can move an object from one place to another under the control of an operator.

Industrial robots are used particularly for performing repetitious, dangerous works like in assembly lines. Not only can the use of industrial robots help hold down costs and improve productivity, but it can also help improve the quality of products by removing human error that inevitably goes into monotonous and difficult work. The revolving type robot is mostly used for arc-welding.

A typical example of an industrial robot is an arc-welding robot. A single arc-welding robot can perform a dozen or more different spotwelds with greater precision than a human.

➤ Related Words:

• Nouns:

<b>Precision</b>	: Kesinlik, doğruluk.
<b>Arc-welding</b>	: Ark kaynağı

• Verbs:

<b>Associate</b>	: İlişkilendirmek.
<b>Define as</b>	: Tanımlamak, belirtmek, tarif etmek, belirlemek.
<b>Hold down</b>	: Sınırlamak, bastırmak.
<b>Improve</b>	: Geliştirmek, iyileştirmek.
<b>Involve</b>	: Sarmak, yol açmak, gerektirmek, kapsamak, karıştırmak.
<b>Manipulate</b>	: 1. elle hareket ettirmek. 2. kullanmak, hareket ettirmek, çalıştırmak.
<b>Perform</b>	: Gerçekleştirmek
<b>Spotweld</b>	: Nokta/punta kaynağı yapmak

• Adjectives:

<b>Monotonous</b>	: Tekdüze, monoton
<b>Repetitious</b>	: Tekrarlayan, tekrarlayıp duran, gereksiz tekrarlar içeren

• Adverbs:

<b>Inevitably</b>	: Kaçınılamaz surette.
<b>Particularly</b>	: Özellikle

➤ Self Study 5

**Left to Right**

- 1- Procedure, routine; course of action; advance
- 2- Enfold in, wrap with, wind around;
- 3- adj. Proportionate, comparative
- 5- It will be completed ..... time. / v- Row
- 6- V-conduct, escort; drive; guide; direct.
- 7- Adult male human / be inclined, be disposed.

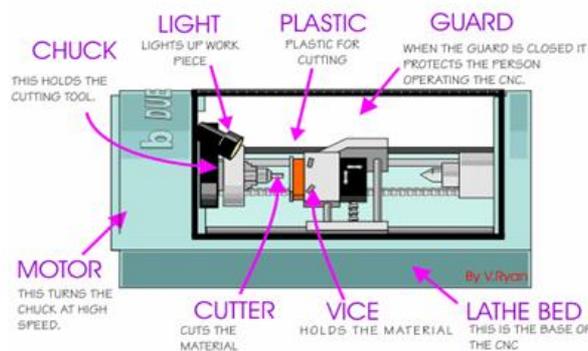
**Up to Down**

- 1- Do, carry out, execute
- 3- I'd better keep it ..... a box.
- 4- Vice, brace, device that applies pressure.
- 5- Consume food; destroy; wear away, corrode; consume
- 6- Small rod with tapered ends around which thread is twisted while spinning;
- 7- Cave; hole
- 8- Young boy.
- 9- I should be ..... home now / Abbreviation of the Light Emitting Diode.

	1	2	3	4	5	6	7	8	9
1									
2				L	A	P			
3									
4									
5				P	A	D	D	L	E
6								A	
7								D	

## 1.7. CNC Machine

In Industry it is not efficient or profitable to make everyday products by hand. On a CNC machine it is possible to make hundreds or even thousands of the same item in a day. First a design is drawn using design software, then it is processed by the computer and manufactured using the CNC machine. Have a look at the photograph on the below. Can you imagine how long it would take a skilled worker to carve this shape out of wood or a soft material - it would probably take a full day. We will be going through its manufacture, one step at a time using a CNC machine. How long do you think manufacturing this product with a CNC machine will take?



**Figure 1.2: Basic Parts of CNC Lathe Machine**

- **VICE:** This holds the material to be cut or shaped. Material must be held securely otherwise it may fly out of the vice when the CNC begins to machine. Normally the vice will be like a clamp that holds the material in the correct position.
- **GUARD:** The guard protects the person using the CNC. When the CNC is machining the material small pieces can be shoot off the material at high speed. This could be dangerous if a piece hit the person operating the machine. The guard completely encloses the the dangerous areas of the CNC.
- **CHUCK:** This holds the material that is to be shaped. The material must be placed in it very carefully so that when the CNC is working the material is not thrown out at high speed.
- **MOTOR:** The motor is enclosed inside the machine. This is the part that rotates the chuck at high speed.
- **LATHE BED:** The base of the machine. Usually a CNC is bolted down so that it cannot move through the vibration of the machine when it is working.

- **CUTTING TOOL:** This is usually made from high quality steel and it is the part that actually cuts the material to be shaped.

1. Draw a small CNC machine and label the most important parts.
2. List the safety factors that people must be aware of before they operate a CNC or similar machine.

- Related Words:

- Nouns:

**Clamp** : Mengene

- Adjectives:

**Efficient** : Etkin, verimli

- Verbs:

**Carve** : Oymak, şekillendirmek.

**Enclose** : 1) Çevresini sarmak, kuşatmak 2) İçine koymak, eklemek.

**Go Through** : İncelemek, gözden geçirmek.

**Throw out** : Bir tarafa atmak, ıskartaya çıkartmak.

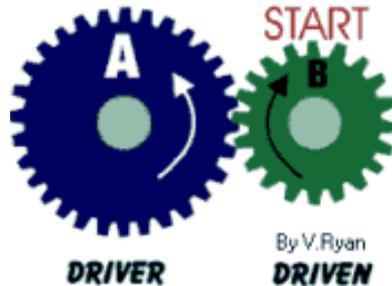
## 1.8. Gears and Gear Systems

Gears can be found in many machines in a workshop or factory and at home they are often an important part of mechanical devices. In a car the gears help the driver to increase and decrease speed as he/she changes the gears with the gear stick.

The gears opposite are called spur gears because they mesh together. Gear “A” is called the “driver” because this is turned by a motor. As gear “A” turns it meshes with gear “B” and it begins to turn as well. Gear ‘B’ is called the ‘driven’ gear.

Gear “A” has 30 teeth and gear “B” has 20 teeth. If gear “A” turns one revolution, how many times will gear “B” turn?

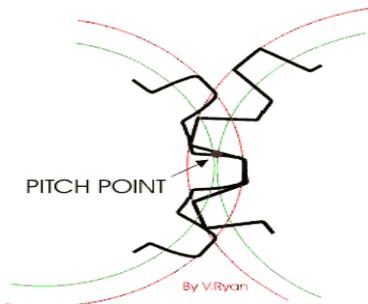
Which gear revolves the fastest ?



When gear “A” completes one revolution gear “B” turns 1,5 revolutions (1½ times)

$$\frac{\text{GEAR A} = 30 \text{ TEETH}}{\text{GEAR B} = 20 \text{ TEETH}} = \frac{30}{20} = 1,5 \text{ (GEAR B)}$$

Gear “B” revolves the fastest. A basic rule of gears is - if a large gear (gear “A”) turns a small gear (gear “B”) the speed increases. On the other hand, if a small gear turns a large gear the opposite happens and the speed decreases.



The gears are known as **spur gears**. The circle marked in red shows the outer limit of the teeth whilst the green circles are known as the **pitch circles**. The pitch circle of a gear is very important as it is used by engineers to determine the shape of the teeth and the ratio between gears .

The **pitch** of a gear is the distance between any point on one tooth and the same point on the next tooth. The **root** is the bottom part of a gear wheel. The pitch point is the point where gear teeth actually make contact with each other as they rotate.

➤ Related Words:

• Nouns:

**Spur gear** : Alın dişlisi, düz dişli  
**Gear stick** : Vites kolu

• Verbs:

**Mesh** : 1) Birbirine geçmek (çark dişi) 2) Ağ ile tutmak 3) Tuzağa düşürmek  
**Revolve** : Dönmek, devir yapmak, devretmek

• Conjunctions:

**Actually** : Gerçekten  
**Whilst** : -iken; esnasında, süresinde

➤ Self Study 6

Fill in the blanks with the suitable words.

**Clamp - Carve - Go through - Revolve - Enclose**

- The earth ..... around the Sun.
- The statue was ..... by John Gibson.
- You should ..... files again to find errors.
- The fence that ..... the house was painted white.
- A dozen bottles held **in place** by .....

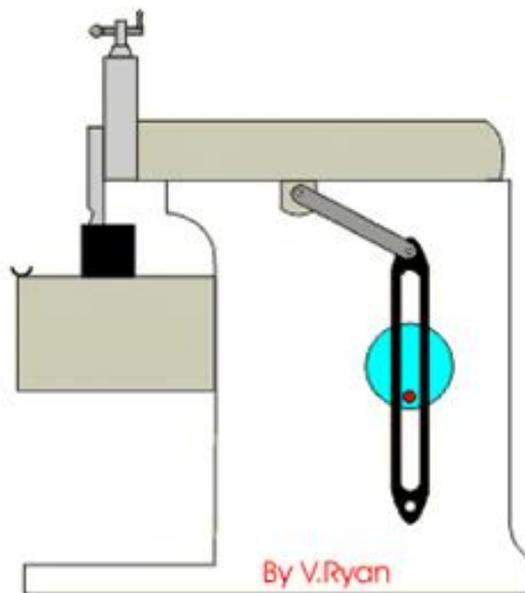
## 1.9. Mechanisms

A quick return mechanism is used where there is a need to convert rotary motion into reciprocating motion. As the disc rotates the black slide moves forwards and backwards. Many machines have this type of mechanism and in the school workshop the best example is the shaping machine.



**Figure 1.3: Quick Return Mechanism**

The **shaping machine** is used to machine flat metal surfaces especially where a large amount of metal has to be removed. Other machines such as milling machines are much more expensive and are more suited to removing smaller amounts of metal, very accurately.



**Figure 1.4: The Shaping Machine**

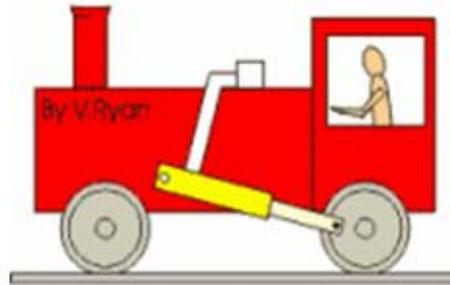
The reciprocating motion of the mechanism inside the shaping machine can be seen in the diagram. As the disc rotates the top of the machine moves forwards and backwards, pushing a cutting tool. The cutting tool removes the metal from work which is carefully bolted down. This mechanism is composed of three important parts:

The crank which is the rotating disc, the slider which slides inside the tube and the connecting rod which joins the parts together.

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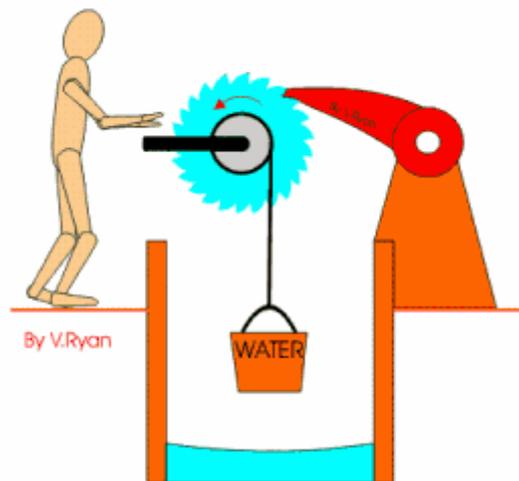
As the slider moves to the right the connecting rod pushes the wheel round for the first 180 degrees of wheel rotation. When the slider begins to move back into the tube, the connecting rod pulls the wheel round to complete the rotation. One of the best examples of a crank and slider mechanism is a steam train. Steam pressure powers the slider mechanism as the connecting rod pushes and pulls the wheel round.

The cylinder of an internal combustion engine is another example of a crank and slider mechanism.



**Figure 1.5: The Cylinder of an Internal Combustion Engine**

A **ratchet mechanism** is based on a wheel that has teeth cut out of it and a pawl that follows as the wheel turns. The ratchet wheel can only turn in one direction - in this case anticlockwise.



**Şekil 1.6: The Ratchet Mechanism**

The water well seen opposite has a ratchet mechanism that allows the person to rotate the handle in an anticlockwise direction. The bucket of water is heavy and so the person can rest by taking his/her hands away from the handle. Ratchet mechanisms are very useful devices for example, they are used in mechanical clocks. They are also very useful when using a system to lift heavy weights.

➤ Related Words:

• Nouns:

<b>Bucket</b>	: Kova
<b>Pawl</b>	: Mandal
<b>Ratchet</b>	: Dişli Çark Mandalı
<b>Reciprocating Motion</b>	: İleri - Geri Hareket

• Verbs:

<b>Bolt Down</b>	: Cıvata ile tutturmak
------------------	------------------------

## 1.10.Catalogues

### 1.10.1. Drilling Machines



Figure 1.7: Drilling Machines

15-inch drill pres is designed to drill metal. It has the weight and rigidity to maintain the built-in tight tolerances and basic to metalworking applications. The drill head looks massive, and it is. Widely spaced bearing surfaces give full quill (The quill providing axial movement as in a drilling machine.) support throughout its travel. These, and bearing surfaces for the ball-bearing drive and for the column, are precision bored simultaneously for exact alignment. And it has the speeds and power for drilling metal, slow speed and high speed models, with heavy-duty infinitely variable drive. This kind of drills are built for production: 3-inch column for greater rigidity and accuracy.

### Infinitely Variable Speed Countershaft Drive

Motor Furnished	A Floor Drill 22" x 19" Table	B Low/High Head & Column Assembly	B Head Only
<b>Low/High Infinitely Variable Speeds: 150-2000 rpm</b>			
2-speed, 3-phase, 220v*	2276	2286-300	2286
2-speed, 3-phase, 440v*	2277	2287-300	2287
<b>Infinitely Variable Speeds: 200-1300 rpm</b>			
1½ Hp, 3-ph, 1140 rpm	2275	2285-300	2285
<b>Infinitely Variable Speeds: 300-2000 rpm</b>			
1½ Hp, 1-ph, 1725 rpm	2272	2282-300	2282
1½ Hp, 3-ph, 1725 rpm	2274	2284-300	2284

\*Motor, 1½-¾ hp 1800/900 rpm, 60hz. SPECIFY VOLTAGE... When voltage is not specified, motor will be wired on lower voltage. Motors are ball bearing. 3-phase single speed motors are 208/220/440v, 60hz. Single-phase motors are capacitor-start, 115/230v, 60hz.

Table 1.8: An Example of a Catalogue of Drilling Machine

➤ Related Words

• Nouns:

<b>Accuracy</b>	: Doğruluk, tamlık
<b>Axial</b>	: Eksenel
<b>Ball Bearing</b>	: Bilyalı yatak
<b>Bearing Surface</b>	: Taşıma Yüzeyi
<b>Built-in</b>	: İçinde var olan, yerleşik
<b>Countershaft Drive</b>	: Grup-mil Sürücüsü
<b>Drill</b>	: Delme
<b>Floor Drill</b>	: Delme zemini
<b>Heavy Duty</b>	: Dayanıklı, ağır iş için elverişli
<b>Hp</b>	: Horse Power
<b>Infinetely Variable Speed</b>	: Çok Değişkenli Hız
<b>Massive</b>	: Büyük, güçlü
<b>Motor Furnished</b>	: Motor Sehpası
<b>Ph</b>	: Phase
<b>Rigidity</b>	: Sertlik
<b>Rpm</b>	: Rotate Per Minute
<b>Specify Voltage</b>	: Belirlenen Gerilim

## 1.10.2. Bending Machines



**Şekil 1.9: An Asymetrical Three-Roll Plate Bending Machine**

**Asymetrical Three-Roll Plate Bending Machines:** This mechanical model is designed for light to medium jobs. It is used in jobs up to 10 mm thickness materials. It is used in Aluminium Bendings. Air Conditioning Channels. Advertising Panel and Machinery Sheet Metal Covers.

### **Technical Specifications and Standard Equipments**

- a) Steel-Welded main Frames
- b) Openable Top Roll (Drop end)
- c) Mobile Control Panel
- d) Motor Powered centralised Rolls
- e) Motorised Back Roll
- f) Main motor with Brake system
- g) Gears under continuous oil bath
- h) Centralised Lubrication System
- i) Conical Bending, Pre-Bending available
- j) Support System for top roll
- k) Back Roll with Ball-Bearings for thin sheet works
- l) Built according to EC Safety Directives
- m) SAE 1050 quality Certificated Steel Rolls with high tensile strength

### **Special Accessories**

- a) Hardened Rolls
- b) Extended Roll Shafts for Section bending
- c) Section Bending Rolls
- d) Digital-Read Out for Back Roll

**IPB-S**  
Asymetrical Three-Roll  
Plate Bending Machine  
Technical Data



MODEL	Working Length (mm.)	Pre-Bending Capacity (mm.)	Bending Capacity (mm.)	Roll Diameter (mm.)	Min. Bending Diameter (mm.)	Main Motor Power (Kw.)	Back Roll Motor (Kw.)	Length (mm.)	Height (mm.)	Width (.mm)	Weight (Kg.)
IPB-S 1050x120	1050	5	6	120	180	2.2	0.75	2550	1020	650	950
IPB-S 1050x130	1050	6	7	130	195	2.2	0.75	2550	1020	650	1050
IPB-S 1050x150	1050	7	8	150	225	3	0.75	2550	1040	680	1400
IPB-S 1050x170	1050	8	9	170	255	4	0.75	2550	1050	720	1750

**Figure 1.10: Catalogue of an Asymetrical Three-Roll Plate Bending Machine**

## 1.11. Useful Components

### ➤ Twist Drills

TS ISO 235, high speed steel, N, 118° bit angle, diameter tolerance h8, right hand cut.



**Şekil 1.11: A Twisted Drill**

**Where to use:** It is produced by hot rolling technology. It is proper to use on conventional machines and in free drilling with hand drills the low alloyed steel, cast iron, metallic and non-metallic materials through its high moment of twisting and its elasticity.

### ➤ Taps

A tap cuts a thread on the inside surface of a hole, creating a female surface which functions like a nut.



**Figure 1.12: Taps**

➤ Die



**Figure 1.13: Dies**

The die cuts a thread on a preformed cylindrical rod, which creates a male threaded piece which functions like a bolt.

➤ Reamers

A reamer or ream is a tool for enlarging holes and is used in metalworking. It may be used as a hand tool or may have a specialized drive end.



**Figure 1.14: Reamers**

➤ Related Words

• Nouns:

<b>Twist Drill</b>	: Matkap Ucu
<b>Tap</b>	: Kılavuz
<b>Die</b>	: Paftal
<b>Reamer</b>	: Rayba
<b>Thread</b>	: Oluk, İz, yiv

## APPLICATION ACTIVITY

### TECHNICAL SPECIFICATONS

X Axis movement .....	900 mm
Y Axis Movement .....	700 mm
Z Axis Movement .....	400 mm
X,Y,Z AXIS FEEDRATE .....	6000 mm/min
Table Dimensions .....	1000x 800 mm
Max.Load Capacity .....	3000 kg.
Spindle Motor Power .....	5,5 kw
Spindle RPM .....	500-8400 rpm
Coolant motor power .....	0,4 kw
Tool Clamping .....	ISO 40
Tool Offset Switch .....	Optional/ .....
Positioning Increment .....	1 micron

Steps of Process	Suggestions
<ul style="list-style-type: none"> <li>➤ Find the words that you do not know from the dictionary.</li> <li>➤ Translate into Turkish</li> </ul>	<ul style="list-style-type: none"> <li>➤ Use a technical dictionary</li> </ul>

## CHECKLIST

If you have behaviors listed below, put (X) in "Yes" box for earned your the skills within the scope of this activity otherwise put (X) in "No" box.

<b>EVALUATION CRITERIA</b>	<b>YES</b>	<b>NO</b>
Did you find the unknown words from a dictionary?		
Did you find the equivalents of the tools and expressions that you used from the dictionary?		
Did you translate the catalogue of the machine into Turkish?		
Did you use the time efficiently? (5-16 hours)		

## EVALUATION

Please review your "No" answers in the form at the end of evaluation. If you do not see enough yourself, be repeat learning activity. If you give all your answers "Yes" to all questions, pass to the "Measuring and Evaluation".

## MEASURING AND EVALUATION

### Choose the correct answer

1. Which word is different from the others?  
A) Spindle                      B) Axle                      C) Pivot                      D) Lever
  2. Which word is synonym of "Clamp"?  
A) Bolt                      B) Nut                      C) Vise                      D) Edge
- Aşağıdaki sorularda, cümlede boş bırakılan yerlere uygun düşen ifadeyi bulunuz.**
3. .... engines save gas.  
A) Enough                      B) Efficient                      C. Appropriate                      D) Blunt
  4. He ..... five holes at equal distance.  
A) Lathe                      B) Milled                      C) Drilled                      D) Meshed
  5. He had been one of the game's most ..... athletes  
A) Versatile                      B) Suitable                      C) Sufficient                      D) Vast
  6. He ..... his name on his desk.  
A) Indicated                      B) Carved                      C) Revolved                      D) Hoisted
  7. Earth is the most ..... of the terrestrial planets.  
A) Monotonous                      B) Repetitious                      C) Massive                      D) Repetitious
  8. If you do something with ....., you do it exactly as it should be done.  
A) Precision                      B) Pivot                      C) Edge                      D) Fulcrum

# LEARNING ACTIVITY-2

## AIM

- You will be able to examine the electric-electronic product catalogues and computer program pages.

## SEARCH

- Search the samples of technical catalogues from internet and the technical companies around.

## 2. ELECTRONICS

### 2.1. Fixed Resistors

A fixed resistor is one in which the value of its resistance cannot change.

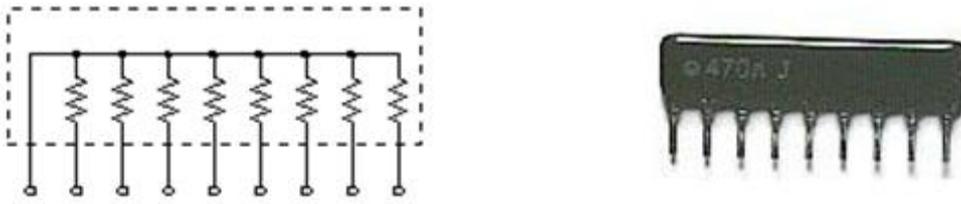
#### 2.1.1. Carbon film resistors

This is the most general purpose, cheap resistor. Usually the tolerance of the resistance value is  $\pm 5\%$ . Power ratings of 1/8W, 1/4W and 1/2W are frequently used.



**Figure 2.1: Fixed Carbon Film Resistors**

Carbon film resistors have a disadvantage; they tend to be electrically noisy. Metal film resistors are recommended for use in analog circuits.



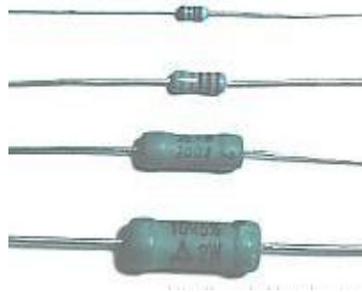
**Figure 2.2: SIL Resistor Network**

Another resistor is called a Single-In-Line(SIL) resistor network. It is made with many resistors of the same value, all in one package. One side of each resistor is connected with one side of all the other resistors inside.

One example of its use would be to control the current in a circuit powering many light emitting diodes (LEDs). In the photograph, 8 resistors are housed in the one package. Each of the leads on the package is one resistor. The ninth lead on the left side is the common lead.

### 2.1.2. Metal Film Resistors

Metal film resistors are used when a higher tolerance (more accurate value) is needed. They are much more accurate in value than carbon film resistors. They have about  $\pm 0.05\%$  tolerance. They have about  $\pm 0.05\%$  tolerance. Resistors that are about  $\pm 1\%$  are more sufficient. Ni-Cr (Nichrome) seems to be used for the material of resistor. The metal film resistor is used for bridge circuits, filter circuits, and low-noise analog signal circuits.



**Figure 2.3: Metal Film Resistors**

#### ➤ Self study 1

Fill in the blanks with the words below.

OHMs - CONTROL - CIRCUIT - SMALL - LARGE - OHMs-LAW

Read the passage regarding resistors. Fill the gaps using correct the words listed above.

Resistors \_\_\_\_\_ the flow of current through a \_\_\_\_\_. Resistance is measured in \_\_\_\_\_. When resistance is high the flow of current is \_\_\_\_\_. When resistance is low the flow of current is \_\_\_\_\_. Resistance, voltage and current are connected in an electrical circuit by \_\_\_\_\_.

## 2.2. Variable Resistors

There are two general ways in which variable resistors are used. One is the variable resistor which value is easily changed, like the volume adjustment of Radio. The other is semi-fixed resistor that is not meant to be adjusted by anyone but a technician. It is used to adjust the operating condition of the circuit by the technician. Semi-fixed resistors are used to compensate for the inaccuracies of the resistors, and to fine-tune a circuit. The rotation angle of the variable resistor is usually about 300 degrees. Some variable resistors must be turned many times to use the whole range of resistance they offer. This allows for very precise adjustments of their value. These are called “Potentiometers” or “Trimmer Potentiometers.”

There are three ways in which a variable resistor’s value can change according to the rotation angle of its axis. When type “A” rotates clockwise, at first, the resistance value changes slowly and then in the second half of its axis, it changes very quickly. The “A” type variable resistor is typically used for the volume control of a radio, for example. It is well suited to adjust a low sound subtly. It suits the characteristics of the ear. The ear hears low sound changes well, but isn’t as sensitive to small changes in loud sounds. A larger change is needed as the volume is increased. These “A” type variable resistors are sometimes called “audio taper” potentiometers.

As for type “B”, the rotation of the axis and the change of the resistance value are directly related. The rate of change is the same, or linear, throughout the sweep of the axis. This type suits a resistance value adjustment in a circuit, a balance circuit and so on. They are sometimes called “linear taper” potentiometers.

Type “C” changes exactly the opposite way to type “A”. In the early stages of the rotation of the axis, the resistance value changes rapidly, and in the second half, the change occurs more slowly. This type isn’t too much used. It is a special use. As for the variable resistor, most are type “A” or type “B”.

## 2.3. Capacitors

The capacitor’s function is to store electricity, or electrical energy. The capacitor also functions as a filter, passing alternating current (AC), and blocking direct current (DC). This symbol  is used to indicate a capacitor in a circuit diagram. The capacitor is constructed with two electrode plates facing each other, but separated by an insulator.

When DC voltage is applied to the capacitor, an electric charge is stored on each electrode. While the capacitor is charging up, current flows. The current will stop flowing when the capacitor has fully charged.

When a circuit tester, such as an analog meter set to measure resistance, is connected to a 10 microfarad ( $\mu\text{F}$ ) electrolytic capacitor, a current will flow, but only for a moment. You can confirm that the meter's needle moves off of zero, but returns to zero right away. When you connect the meter's probes to the capacitor in reverse, you will note that current once again flows for a moment. Once again, when the capacitor has fully charged, the current stops flowing. So the capacitor can be used as a filter that blocks DC current. (A "DC cut" filter.)

However, in the case of alternating current, the current will be allowed to pass. Alternating current is similar to repeatedly switching the test meter's probes back and forth on the capacitor. Current flows every time the probes are switched.

The value of a capacitor (the capacitance), is designated in units called the Farad (F). The capacitance of a capacitor is generally very small, so units such as the microfarad (10-6F) , nanofarad ( 10-9F ), and picofarad (10-12F ) are used. Recently, an new capacitor with very high capacitance has been developed. The Electric Double Layer capacitor has capacitance designated in Farad units. These are known as "Super Capacitors."

Sometimes, a three-digit code is used to indicate the value of a capacitor. There are two ways in which the capacitance can be written. One uses letters and numbers, the other uses only numbers. In either case, there are only three characters used. [10n] and [103] denote the same value of capacitance. The method used differs depending on the capacitor supplier. In the case that the value is displayed with the three-digit code, the 1st and 2nd digits from the left show the 1st figure and the 2nd figure, and the 3rd digit is a multiplier which determines how many zeros are to be added to the capacitance. Picofarad ( pF ) units are written this way. For example, when the code is [103], it indicates  $10 \times 10^3$ , or  $10,000\text{pF} = 10 \text{ nanofarad}(\text{nF}) = 0.01 \text{ microfarad}(\mu\text{F})$ .

If the code happened to be [224], it would be  $22 \times 10^4 =$  or  $220,000\text{pF} = 220\text{nF} = 0.22\mu\text{F}$ . Values under  $100\text{pF}$  are displayed with 2 digits only. For example, 47 would be  $47\text{pF}$ .

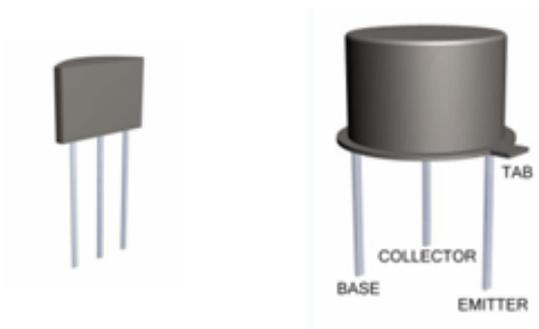
The capacitor has an insulator (the dielectric) between 2 sheets of electrodes. Different kinds of capacitors use different materials for the dielectric.

## 2.4. Transistors

Transistors can be regarded as a type of switch, as can many electronic components. They are used in a variety of circuits and you will find that it is rare that a circuit built in a school Technology Department does not contain at least one transistor. They are central to electronics and there are two main types; NPN and PNP. Most circuits tend to use NPN.

There are hundreds of transistors which work at different voltages but all of them fall into these two categories.

Transistors are manufactured in different shapes but they have three leads (leg). The **BASE** - which is the lead responsible for activating the transistor. The **COLLECTOR** - which is the positive lead. The **EMITTER** - which is the negative lead. The diagram below shows the symbol of an NPN transistor. They are not always set out as shown in the diagrams to the left and right, although the 'tab' on the type shown to the left is usually next to the 'emitter'.



**Figure 2.4: Metal Film Resistors**

➤ Related Words:

• Nouns:

**Inaccuracy** : Hata, kusur.

• Verbs:

**Compensate** : Karşılama. telâfi etmek. eşitlemek. Denkleme.

**Tend to** : 1. Yatkın olmak, eğilimi olmak, bakmak, yönelmek.  
2. Hizmet etmek, gözetmek, çalmak yüz tutmak.

**Set out** :  
1. Düzenlemek.  
2. Yola çıkmak; (to ile) başlamak.  
3. Açıklamak, belirtmek.  
4. Koyulmak, kalkışmak.

**Denote** : Göstermek, belirtmek. belirtmek

• Adjectives:

**Sufficient** : Yeterli, elverişli, uygun.

**Precise** : Tam, kesin

**Regarded** : Kabul edilen

• Adverbs:

**Subtly** : Ustaca, mahirâne; ince; zekice

**As for** : -e gelince, ise:

As for me, I'm not going. (Bense gitmiyorum.)

## 2.5. Soldering Practices

### 2.5.1. How important is soldering?

Among the foremost of reasons an electronic project frequently fails to work properly is due to "poor" soldering practices. This is usually caused by "dry joints" when soldering.

### 2.5.2. Dry joints when soldering

At first glance many solder joints appear to be quite "O.K." but on closer examination many are in fact defective. The insidious problem with dry joints in soldering is that the circuit frequently performs alright for a period of time, even years before failure.

### 2.5.3. Good soldering practices for your electronic project

The cause of dry joints in soldering is mostly the improper application of heat. Both the component leg and the PCB need to be both heated simultaneously to the correct temperature to allow the solder to flow freely between BOTH surfaces. Obviously this requires practice and most newcomers inevitably get it wrong.

Improper heating while soldering and its consequences can be seen below.

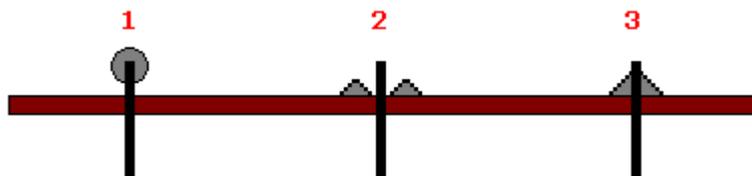


Figure 2.5: Soldering

- Correct soldering procedures to avoid dry joints

Here in figure 2.5 entitled "correct soldering procedures to avoid dry joints" we have three examples of soldering depicted. The first example indicates the component lead was heated while the PCB wasn't heated. As a consequence the solder only flowed onto the component lead.

In the second example of soldering in figure 1 we find the PCB was correctly heated while little or inadequate heat was applied to the component lead. This is the most treacherous example because although it is very obvious in the diagram, in practice it is not always particularly obvious. Often this type of dry joint "just" allows the solder to "touch" the component lead while not actually being "soldered" to the lead. Of course it might work for a period of time depending upon environmental conditions of heat and cold.

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In the final example of “correct soldering procedures to avoid dry joints”. In this case the PCB and the component lead were both heated “simultaneously” AND the solder was applied to either the component lead or the PCB to “flow” freely from one to the other to provide a good “electrical” joint. Such a joint is always “bright and shiny”, **dull** looking joints are often suspect.

You never apply the solder to the soldering iron “tip”. Solder is always applied to the “job”, never the soldering iron. Allow the solder to “set” and cool before proceeding to the next joint.

#### **2.5.4. Rules for good soldering**

- Use a reasonable quality iron of the correct wattage for the job.
- Only use “electronic” resin cored solder of fine gauge.
- Make sure all surfaces to be soldered are “bright, shiny” and thoroughly clean.
- Make sure the solder tip is clean, shiny and properly “wetted”.
- Remember the soldering iron tip is only to heat up the surfaces to be soldered.
- Apply the resin cored solder to the heated “job”, not to the soldering iron tip.
- Remember to visually inspect ALL of your soldered joints, preferably with magnifying glasses.
- Consider using your multimeter to provide an “electrical continuity” check between various parts of the circuit.

➤ Related Words:

• Nouns:

<b>Newcomers</b>	: Yeni gelen, yeni gelmiş kimse.
<b>Glance</b>	: Bakış, göz atma.
<b>Resin</b>	: Reçine.
<b>Soldering</b>	: Lehimleme.
<b>Gauge</b>	: Ölçme, kalibrasyon, ayarlama.

• Verbs:

<b>Depict</b>	: Tarif etmek; anlatmak tasvir etmek tanımlamak.
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• Adjectives:

<b>Defective</b>	: Kusurlu, sakat, eksik, noksan
<b>Insidious</b>	: Sinsi, gizlice fırsat kollayan.
<b>Obvious</b>	: Belli, açık, apaçık, aşikâr.
<b>Foremost</b>	: Başta gelen, en öndeki.
<b>Wetted</b>	: Islatılmış, nemlendirilmiş.
<b>Treachorous</b>	: Tehlikeli, kalleş.
<b>Dull</b>	: Donuk, sönük.

• Adverbs:

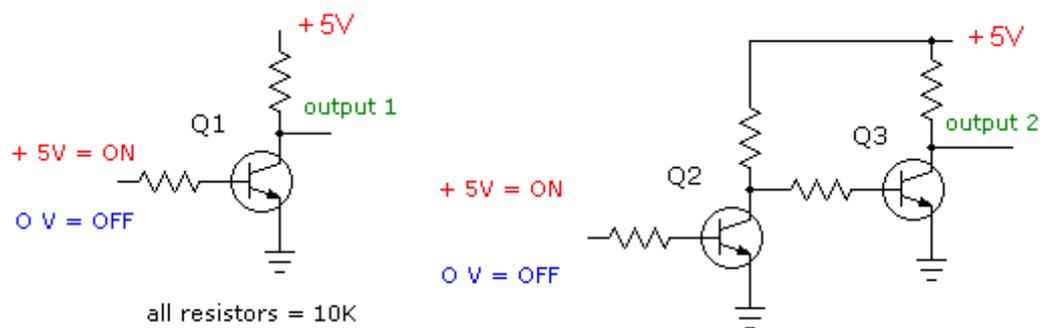
<b>Inevitably</b>	: Kaçınılmaz şekilde.
<b>Simultaneously</b>	: Eşzamanlı bir şekilde.
<b>Thoroughly</b>	: Tamamiyle. Bastan aşağı, tamamen, iyice.

## 2.6. What are the digital basics?

Digital circuits work on the basis of a transistor being used as a switch. Consider a light switch, a transistor can be considered almost the same and in some circuits transistors are used to control large amounts of power with very little input power being used.

In the first circuit if there is no voltage applied to the base of Q1 then it is not switched “on” and accordingly the + 5V passing through the 10K load resistor from our + 5V supply appears at both the collector of the transistor and also at output 1.

If we apply + 5V to the base of Q1 then because it is greater than 0.7 V than the grounded emitter, Q1 will switch on just like a light switch causing the + 5V from our supply to drop entirely across the 10K load resistor. This load could also be replaced by a small light bulb, relay or LED in conjunction with a resistor of suitable value. In any event the bulb or led would light or the relay would close.



**Figure 2.6: Transistors as Digital Switches in Digital Basics**

The basic principle in digital basics is that we have just created an “electronic switch” where the positive voltage on the base produces zero voltage at the output and zero voltage on the input produces the + 5V on the output.

The output is always the opposite to the input and in digital basics terms this is called an “inverter” a very important property. Now looking at Q2 and Q3 to the right of the schematic we simply have two inverters chained one after the other. Here if you think it through the final output 2 from Q3 will always follow the input given to Q2.

### 2.6.1. Logic Blocks in Digital Basics

Depending upon how these “switches” and “inverters” are arranged in integrated circuits we are able to obtain “logic blocks” to perform various tasks. The most basic logic blocks can be seen in the below.

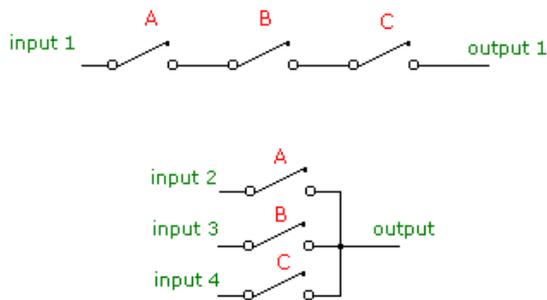


Figure 2.7: Basic Logic Blocks

### 2.6.2. Digital switches in digital basics

In the first set of switches A, B, and C they are arranged in “series” so that for the input to reach the output all the switches must be closed. This may be considered an “AND-GATE”.

In the second set of switches A, B, and C they are arranged in “parallel” so that for any input to reach the output any one of the switches may be closed. This may be considered an “OR-GATE”.

These are considered the basic building blocks in digital logic. If we added “inverters” to either of those blocks, called “Gates”, then we achieve a “NAND-GATE” and a “NOR-GATE” respectively.

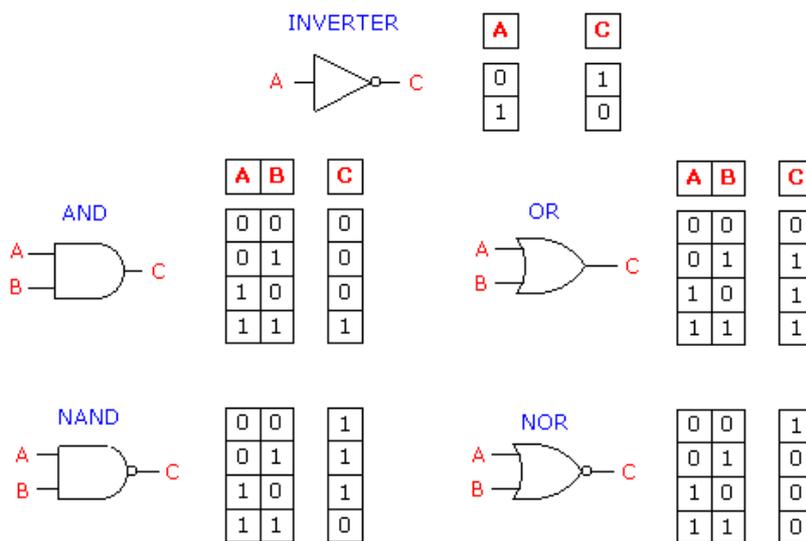


Figure 2.8: Digital Basics in Schematic Form

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Now here we have depicted four major logic blocks AND-GATE, NAND-GATE, OR-GATE and NOR-GATE plus the inverter. Firstly, the “1’s” and the “0’s” or otherwise known as the “ones” and “zeros”. A “1” is a HIGH voltage (usually the voltage supply) and the “0” is no voltage or ground potential. Other people prefer designating “H” and “L” for high and low instead of the “1’s” and the “0’s”.



➤ Related Words:

• Nouns:

<b>Basis</b>	: Temel, esas
<b>Switch</b>	: Elektrik anahtarı/düğmesi, anahtar, düğme
<b>Load resistor</b>	: Yük Direnci
<b>Conjunction</b>	: Birleşme
<b>Schematic</b>	: Şematik
<b>Plus</b>	: Artı, ilave

• Verbs:

<b>Achieve</b>	: Başarmak, elde etmek
<b>Pass through</b> etmek	: İçinden geçmek, arasından geçmek, içine işlemek, nüfuz etmek
<b>Replace</b> geçmek.	: Yerine koymak, değiştirmek, yenisiyle değiştirmek, yerine geçmek.
<b>Arrange</b>	: Düzenlemek, ayarlamak, yoluna koymak
<b>Depict</b>	: Tarif etmek, resmetmek, resmini çizmek, betimlemek, anlatmak, göstermek.

• Adverbs

<b>Accordingly</b>	: Bu yüzden, bu nedenle.
<b>Entirely</b>	: Tamamen.
<b>Respectively</b>	: Sırasıyla, ayrı ayrı

• Adjectives:

<b>Various</b>	: Çeşitli
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## Self Study 2

Fill in the blanks with the words given below

**DEPIC – RESPECTIVELY - VARIOUS - ARRANGE - ENTIRELY**

- The trace is ..... lost, they couldn't find the way.
- This scene ..... country life that i missed too much.
- The methods are many and .....
- Their sons, Ben and Jonathan, were three and six .....
- Elif's going to ..... the furniture in this room.

## 2.7. What are computers used for?

Computers are used for a wide variety of purposes.

- **Data processing** is commercial and financial work. This includes such things as billing, shipping and receiving, inventory control, and similar business related functions, as well as the “electronic office”.
- **Scientific processing** is using a computer to support science. This can be as simple as gathering and analyzing raw data and as complex as modelling natural phenomenon (weather and climate models, thermodynamics, nuclear engineering, etc.).
- **Multimedia** includes content creation (composing music, performing music, recording music, editing film and video, special effects, animation, illustration, laying out print materials, etc.) and multimedia playback (games, DVDs, instructional materials, etc.).

### 2.7.1. Parts of a Computer

The classic crude oversimplification of a computer is that it contains three elements: processor unit, memory, and I/O (input/output). The borders between those three terms are highly ambiguous, non-contiguous, and erratically shifting.

A slightly oversimplification divides a computer into five elements: arithmetic and logic subsystem, control subsystem, main storage, external storage, input and output subsystem.

- processor (Arithmetic and logic units, control units)
- main storage
- external storage
- input and output units

### **2.7.2. Processor**

The processor is the part of the computer that actually does the computations. This is sometimes called an MPU (for main processor unit) or CPU (for central processing unit or central processor unit).

A processor typically contains an arithmetic/logic unit (ALU), control unit (including processor flags, flag register, or status register), internal buses, and sometimes special function units (the most common special function unit being a floating point unit for floating point arithmetic). Some computers have more than one processor. This is called multi-processing. The major kinds of digital processors are: CISC, RISC, DSP, and hybrid.

CISC stands for Complex Instruction Set Computer. Mainframe computers and minicomputers were CISC processors, with manufacturers competing to offer the most useful instruction sets. Many of the first two generations of microprocessors were also CISC.

RISC stands for Reduced Instruction Set Computer. RISC came about as a result of academic research that showed that a small well designed instruction set running compiled programs at high speed could perform more computing work than a CISC running the same programs.

DSP stands for Digital Signal Processing. DSP is used primarily in dedicated devices, such as MODEMs, digital cameras, graphics cards, and other specialty devices. Hybrid processors combine elements of two or three of the major classes of processors.

### **2.7.3. Arithmetic and Logic**

An arithmetic/logic unit (ALU) performs integer arithmetic and logic operations. It also performs shift and rotate operations and other specialized operations. Usually floating point arithmetic is performed by a dedicated floating point unit (FPU), which may be implemented as a co-processor.

### **2.7.4. Main storage**

Main storage is also called memory or internal memory (to distinguish from external memory, such as hard drives).

RAM is Random Access Memory, and is the basic kind of internal memory. RAM is called “random access” because the processor or computer can access any location in memory. RAM has been made from transistors, integrated circuits, magnetic core, or anything that can hold and store binary values (one/zero, plus/minus, open/close, positive/negative, high/low, etc.). Most modern RAM is made from integrated circuits.

ROM is Read Only Memory (it is also random access, but only for reads). ROM is typically used to store things that will never change for the life of the computer, such as low level portions of an operating system. Some processors (or variations within processor families) might have RAM and/or ROM built into the same chip as the processor (normally used for processors used in standalone devices, such as arcade video games, ATMs, microwave ovens, car ignition systems, etc

### **2.7.5. External storage**

External storage (also called auxillary storage) is any storage other than main memory. In modern times this is mostly hard drives and removeable media (such as floppy disks, Zip disks, optical media, etc.). With the advent of USB and FireWire hard drives, the line between permanent hard drives and removeable media is blurred.

### **2.7.6. Input/output overview**

Most external devices are capable of both input and output (I/O). Some devices are inherently input-only (also called read-only) or inherently output-only (also called write-only). Regardless of whether a device is I/O, read-only, or write-only, external devices can be classified as block or character devices.

A character device is one that inputs or outputs data in a stream of characters, bytes, or bits. Character devices can further be classified as serial or parallel. Examples of character devices include printers, keyboards, and mice.

A serial device streams data as a series of bits, moving data one bit at a time. Examples of serial devices include printers and MODEMs.

A parallel device streams data in a small group of bits simultaneously. Usually the group is a single eight-bit byte (or possibly seven or nine bits, with the possibility of various control or parity bits included in the data stream). Each group usually corresponds to a single character of data. Rarely there will be a larger group of bits (word, longword, doubleword, etc.). The most common parallel device is a printer (although most modern printers have both a serial and a parallel connection, allowing greater connection flexibility).

➤ Related Words:

• Nouns:

<b>Advent</b>	: Varış, geliş
<b>Billing</b>	: Faturalandırma
<b>Co-processor.</b>	: Yardımcı işlemci
<b>Flexibility</b>	: Esneklik
<b>Floating point</b>	: Kayan noktalı
<b>Ignition</b>	: Oto. Ateşleme sistemi
<b>Inventory</b>	: 1. Envanter. stok. 2. Deftere kayıtlı eşya, demirbaş.
<b>Multimedia</b>	: Çoklu ortam
<b>Oversimplification</b>	: Aşırı basitleştirme
<b>Specialty</b>	: Uzmanlık alanı, özel ilgi alanı, ihtisas, branş
<b>Stream</b>	: Akış, akıntı, akım

• Verbs

<b>Came about</b>	: Meydana gelmek, olmak
<b>Compete</b>	: Yarışmak , rekabet etmek
<b>Compile</b>	: Sembolik bir programlama dilinde yazılmış bir programı, makine dilinde bir programa dönüştürmek.
<b>Implement</b>	: Yerine getirmek, gerçekleştirmek
<b>Lay out</b>	: Tasarlamak, düzenlemek, hazırlamak.
<b>Offer</b>	: Vermek, sağlamak, sunmak
<b>Stands for</b>	: Yerine geçmek, - i simgelemek

• Adjectives

<b>Ambiguous</b>	: Belirsiz, muğlak
<b>Auxillary</b>	: Yardımcı, yedek
<b>Blurred</b>	: Donuk, bulanık.
<b>Capable</b>	: Yetenekli, muktedir
<b>Crude</b>	: Ham, işlenmemiş, kaba
<b>Dedicated</b>	: Tahsis edilmiş, adanmış
<b>Internal</b>	: İç, dahili
<b>Non- contiguous</b>	: Bağlantısız
<b>Permanent</b>	: Sabit, kalıcı, sürekli
<b>Removeable</b>	: Sökülebilir

• Adverbs

<b>Erratically</b>	: Değişken olarak, kararsızca
<b>Inherently</b>	: Doğuştan, doğal olarak
<b>Regardless</b>	: Herşeye rağmen , ne olursa olsun.

➤ Self study 3

Match the words in “1” and “2” with the definitions given below.

1. DEDICATED - STREAM - BLURRED -  
PERMANENT

.....: A current of water or other fluid  
.....: Continuing in the same state  
.....: Devoted to a cause or ideal or purpose  
.....: Unclear in form or expression

2. AMBIGUOUS - CAPABLE - CRUDE -  
OFFER

This agreement is very ..... and open to various interpretations.

He appeared hardly ..... of conducting a coherent conversation.

The stores are ..... specials on sweaters this week.

..... substances are in a natural or unrefined state, and have not yet been used in manufacturing processes.

- **Hardly** : Hemen hemen  
➤ **Conduct** : Yürürtmek  
➤ **Coherent** : Tutarlı  
➤ **Interpretation** : Yorum

## 2.8. Computer Networks

### 2.8.1. What is a Network?

A network consists of two or more computers that are linked in order to share resources (such as printers and CD-ROMs), exchange files, or allow electronic communications. The computers on a network may be linked through cables, telephone lines, radio waves, satellites, or infrared light beams.

The two basic types of networks include:

- Local Area Network (LAN)  
➤ Wide Area Network (WAN)

## 2.8.2. Local Area Network

A Local Area Network (LAN) is a network that is confined to a relatively small area. It is generally limited to a geographic area such as a writing lab, school, or building.

In a typical LAN configuration, one computer is designated as the file server. It stores all of the software that controls the network, as well as the software that can be shared by the computers attached to the network. Computers connected to the file server are called workstations. The workstations can be less powerful than the file server, and they may have additional software on their hard drives. On most LANs, cables are used to connect the network interface cards in each computer.

## 2.8.3. Wide Area Network

Wide Area Networks (WANs) connect larger geographic areas, such as Florida, the United States, or the world. Dedicated transoceanic cabling or satellite uplinks may be used to connect this type of network.

Using a WAN, schools in Florida can communicate with places like Tokyo in a matter of minutes, without paying enormous phone bills. A WAN is complicated. It uses multiplexers to connect local and metropolitan networks to global communications networks like the Internet. To users, however, a WAN will not appear to be much different than a LAN or a MAN.

## 2.8.4. IP Addresses

In order for systems to locate each other in a distributed environment, nodes are given explicit addresses that uniquely identify the particular network the system is on and uniquely identify the system to that particular network. When these two identifiers are combined, the result is a globally-unique address.

This address, known as IP address, as IP number, or merely as IP is a code made up of numbers separated by three dots that identifies a particular computer on the Internet. These addresses are actually 32-bit binary numbers, consisting of the two subaddresses (identifiers) mentioned above which, respectively, identify the network and the host to the network, with an imaginary boundary separating the two. An IP address is, as such, generally shown as 4 octets of numbers from 0-255 represented in decimal form instead of binary form.

For example, the address 168.212.226.204 represents the 32-bit binary number 10101000.11010100.11100010.11001100.

The binary number is important because that will determine which class of network the IP address belongs to. The Class of the address determines which part belongs to the network address and which part belongs to the node address.

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The location of the boundary between the network and host portions of an IP address is determined through the use of a subnet mask. This is another 32-bit binary number which acts like a filter when it is applied to the 32-bit IP address. By comparing a subnet mask with an IP address, systems can determine which portion of the IP address relates to the network and which portion relates to the host. Anywhere the subnet mask has a bit set to 1, the underlying bit in the IP address is part of the network address. Anywhere the subnet mask is set to 0, the related bit in the IP address is part of the host address.

If network address is same for any two computers, these computers are in the same network. And they are connected each other with hub or switch. But if network addresses are different, they are not in the same network. For this reason, these different networks are connected each other via router.

An Internet Service Provider (ISP) will generally assign either a static IP address (always the same) or a dynamic address (changes every time one logs on). ISPs and organizations usually apply to the InterNIC for a range of IP addresses so that all clients have similar addresses. There are about 4.3 billion IP addresses. The class-based, legacy addressing scheme places heavy restrictions on the distribution of these addresses.

➤ Related Words:

• Nouns:

<b>Boundary</b>	: Sınır
<b>Distribution</b>	: Dağıtım
<b>Dot</b>	: Nokta
<b>Legacy</b>	: Miras
<b>Node</b>	: Düğüm
<b>Portion</b>	: Kısım, parça, bölüm
<b>Represent</b>	: Göstermek, betimlemek, tasvir etmek
<b>Restriction</b>	: Kısıtlama, sınırlama
<b>Scheme</b>	: Plan, proje, şema

• Verbs:

<b>Assign</b>	: Atamak
<b>Confine</b>	: Hapsetmek, kapatmak, sınırlamak

• Adjectives:

<b>Distributed</b>	: Dağıtık
<b>Explicit</b>	: Açık, net, aşıkâr
<b>Enormous</b>	: Kocaman, muazzam.
<b>Imaginary</b>	: Sanal
<b>Particular</b>	: Özel, - e özgü

• Adverbs:

<b>Merely</b>	: Sadece
<b>Relatively</b>	: 1. Oranla, nispeten, 2. Oldukça, epeyce
<b>Uniquely</b>	: Eşsiz olarak
<b>Via</b>	: Üzerinden

## APPLICATION ACTIVITY

Öncelikle koyu yazılan kelimelerin anlamlarını araştırınız. Daha sonra parçayı türkçeye çeviriniz.

Steps of Process	Suggestions
Translate the text below into Turkish.	<ul style="list-style-type: none"><li>➤ Read the whole text.</li><li>➤ While reading try to predict the bold typed terms that you do not know.</li><li>➤ Find the english equivalents of the terms from technical dictionaries that you can't predict.</li><li>➤ You can find detailed information about the terms from the text.</li></ul>

### HOW TO CARE FOR A COMPUTER

#### Step1

A manual came with your machine and you should keep it **handy** in case of problems. You also should **skim** the sections on areas where you frequently experience difficulty. Also **utilize** the help feature that comes with your operating system.

#### Step2

Online forums and support groups are especially useful, since someone has usually experienced the same problems you **encounter** and **posted** advice.

#### Step3

Take **precautions** to protect the security and health of your computer. Install virus protection software, a firewall, and any other programs that can help protect your computer. **Just in case, back up** your computer files on a **regular** schedule. Special software is available to help with back up, or you can **duplicate** your work on a CD or external hard drive.

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#### **Step4**

If your computer freezes up, it's trying to tell you something is wrong. While rebooting your computer often solves the problem **temporarily**, the cause of the problem won't go away so easily. Check that your disk isn't full, since this is a common cause of poor computer performance.

#### **Step5**

Use the system tools that come with your computer. Tools such as ScanDisk and System Defragmenter can be found under the Accessories tab.

#### **Step6**

Maintain your computer on a regular basis to prevent **sluggish** behavior. Empty your recycle bin and delete **bulky** files that you aren't using.

## CHECKLIST

If you have behaviors listed below, put (X) in “Yes” box for earned your the skills within the scope of this activity otherwise put (X) in “No” box.

<b>EVALUATION CRITERIA</b>	<b>YES</b>	<b>NO</b>
Did you find the unknown words from a dictionary?		
Did you find the equivalents of the tools and expressions that you used from the dictionary?		
Did you translate the catalogue of the machine into Turkish?		
Did you use the time efficiently? (5-16 hours)		

## EVALUATION

Please review your "No" answers in the form at the end of evaluation. If you do not see enough yourself, be repeat learning activity. If you give all your answers "Yes" to all questions, pass to the "Measuring and Evaluation".

## MEASURING AND EVALUATION

**Find the antonyms of the words given at the end of the sentences.**

1. Which word is synonym of “**denote**”?  
A)Indicate                      B)Assign                      C)Confine                      D)Conduct
2. Which word is synonym of “**particular**”?  
A)Interesting                      B)Splendid                      C)Special                      D)Superb
3. Which word is synonym of “**confine**”?  
A)Achieve                      B)Compete                      C)Restrict                      D)Develop

**Fill in the blanks with the suitable word.**

4. He was one of the world's ..... scholars of ancient Indian culture.  
A)Foremost      B)Obvious      C)Sufficient                      D)Distributed
5. If you .....something to someone, you ask them if they would like to have it or use it.  
A)Hardly      B)Offer      C)Suffer                      D)Conduct

# MODULE EVALUATION

Translate the technical specifications of the CNC Milling Machine given below.

## CNC MILLING MACHINE

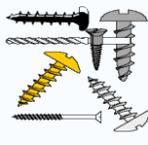
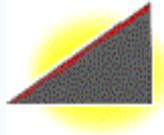
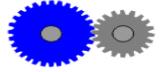


SPECIFICATIONS	.....
Servo drive, electric and control systems are integrated in machine frame.	..... .....
Stress relieved rigid constructed body.	..... .....
Central Lubrication System	..... .....
Program controlled coolant system	.....
Recirculating preloaded ball screws in X-Y and Z axes.	..... .....
Linear guideways.	.....
Separate manual control unit for easy setup of workpiece.	..... .....
Spindle and feed override function (0-100%)	.....
Spindle loading indicator	.....
Program backup and update can be done easily.	..... .....
2 or 3 axes AutoCad.dxf files can be directly control the motion. Compatibility to all popular CAD/CAM NC toolpath files.	..... .....

# ANSWER KEY

## LEARNING ACTIVITY - 1

➤ **SELF STUDY 1**

		
<b>PULLEY</b>	<b>SCREW</b>	<b>SCREWDRIVER</b>
		
<b>WHEEL-AXLE</b>	<b>INCLINED-PLANE</b>	<b>LEVER</b>
		
<b>BOLT-NUT</b>	<b>GEAR</b>	<b>WISE</b>

➤ **SELF STUDY 2**

	1	2	3	4	5	6	7	8	9	10	11
1	C	R	O	W	B	A	R		L	O	G
2		O		O		B		W			R
3		T	E	E	N	A	G	E	R		O
4		A				T		D			O
5	W	R	A	P		E	G	G			V
6		Y		E				E	D	G	E
7			C	R	A	N	E				

➤ **SELF STUDY 3**

Match the given words below

1. Accomplish	Attach	( 3 )
2. Stationary	Enlarge a hole	( 6 )
3. Affix	Carry Out	( 8 )
4. Vast	Bore	( 7 )
5. Circumstance	Occasion	( 5 )
6. Ream	Various	( 10 )
7. Drill	Enormous	( 4 )
8. Perform	Achieve	( 1 )
9. Adapt	Steady	( 2 )
10. Several	Adjust	( 9 )

➤ **SELF STUDY 4**

	<b>Blunt</b>	<b>Irregular</b>	<b>Eccentric</b>	<b>Proper</b>	<b>Insufficient</b>
Concentric	X		<b>Eccentric</b>		
Inappropriate	X		<b>Proper</b>		
Regular	X		<b>Irregular</b>		
Sharp	X		<b>Blunt</b>		
Excessive	X		<b>Insufficient</b>		

➤ **SELF STUDY 5**

	1	2	3	4	5	6	7	8	9
1	P	R	O	C	E	S	S		A
2	E			L	A	P			T
3	R	E	L	A	T	I	V	E	
4	F			M		N			L
5	O	N		P	A	D	D	L	E
6	R		I			L	E	A	D
7	M	A	N		T	E	N	D	

➤ **SELF STUDY 6**

Fill in the blanks with the words given below.

**Clamp**

**Carve**

**Go through**

**Revolve**

**Enclose**

- The earth revolves around the Sun.
- The statue was carved by John Gibson.
- You should go through the files again to find errors.
- The fence that enclosed the house was painted white.
- A dozen bottles held in place by a clamp.

## APPLICATION ACTIVITY

### TECHNICAL SPECIFICATONS

X Axis movement X Eksen Hareketi	900 mm
Y Axis Movement Y Eksen Hareketi	700 mm
Z Axis Movement Z Eksen Hareketi	400 mm
X,Y,Z AXIS FEEDRATE X,Y,Z İlerleme Hızı	6000 mm/min          6000mm/min
Table Dimensions Tabla Ebatları	1000x 800 mm
Max.Load Capacity Max. Yük Kapasitesi	3000 kg.
Spindle Motor Power İş Mili Motor Gücü	5,5 kw
Spindle RPM / İş mili Devrei	500-8400 rpm
Coolant motor power Soğutma suyu moroe gücü	0,4 kw
Tool Clamping Takım Tutucu	ISO 40
Tool Offset Switch Takım Ofset Alma Anahtarı	Optional/ İsteğe bağlı
Positioning Increment Pozisyonlama Girişi	1 micron          1 mikron

## MEASURING AND EVALUATION

1	D
2	C
3	D
4	C
5	A
6	B
7	C
8	A

## LEARNING ACTIVITY - 2

### ➤ SELF STUDY 1

#### **OHMs CONTROL - CIRCUIT - SMALL - LARGE - OHMs-LAW**

Resistors **CONTROL** the flow of current through a **CIRCUIT**. Resistance is measured in **OHMs**. When resistance is high the flow of current is **SMALL**. When resistance is low the flow of current is **LARGE**. Resistance, voltage and current are connected in an electrical circuit by **OHMs-LAW**.

### ➤ SELF STUDY 2

#### **DEPICT - RESPECTIVELY - VARIOUS - ARRANGE - ENTIRELY**

The trace is **ENTIRELY** lost, they couldn't find the way.

This scene **DEPICTS** country life that i missed too much.

The methods are many and **VARIOUS**.

Their sons, Ben and Jonathan, were three and six **RESPECTIVELY**..

Elif's going to **ARRANGE** the furniture in this room.

### ➤ SELF STUDY 3

#### **DEDICATED - STREAM - BLURRED - PERMANENT**

**STREAM** : A current of water or other fluid

**PERMANENT**: Continuing in the same state

**DEDICATED** : Devoted to a cause or ideal or purpose

**BLURRED** : Unclear in form or expression

#### **AMBIGUOUS - CAPABLE - CRUDE - OFFER**

This agreement is very **AMBIGUOUS** and open to various interpretations.

He appeared hardly **CAPABLE** of conducting a coherent conversation.

The stores are **OFFERING** specials on sweaters this week.

**CRUDE** substances are in a natural or unrefined state, and have not yet been used in manufacturing processes.

## APPLICATION ACTIVITY

### BİR BİLGİSAYARIN BAKIMI NASIL OLUR?

#### Adım 1

Problemlerle karşılaştığınızda, makinanızla gelen kitapçığı el altında buldurmamalısınız. Ayrıca çok sık sorun yaşadığınız konularla ilgili bölümlere göz atmalısınız. İşletim sistemiyle gelen yardım özelliğinden de faydalanabilirsiniz.

#### Adım 2

Sizin karşılaştığınız benzer problemleri yaşamış olan herhangi birisinin bıraktığı tavsiyelerin bulunduğu forum ve destek gurupları özellikle faydalıdır.

#### Adım 3

Bilgisayarınızın sağlığı ve güvenliğini korumak için tedbirler alın. Virüs koruma programı kurun, bir ateş duvarı veya bilgisayarınızı korumaya yardımcı olacak herhangi bir program. Her ihtimale karşı, belirli bir süreyle bilgisayarınızdaki dosyaların yedeğini alın. Yedeklemeye yardım etmek için özel bir yazılım kullanabileceğiniz gibi, çalışmalarınızı CD veya harici sabit diske kopyalayabilirsiniz.

#### Adım 4

Eğer bilgisayarınız kilitleniyorsa, size bazı şeylerin yanlış gittiğini söylemeye çalışıyordur. Bilgisayarınızı sık sık yeniden başlatmanız problemi geçici olarak çözsede, problemin asıl kaynağını kolay kolay düzeltemez. Sabitdiskinizin dolu olmadığını emin olunuz, çünkü bu düşük bilgisayar performansının ana sebeplerinden biridir.

#### Adım 5

Bilgisayarınızla birlikte gelen sistem araçlarını kullanın. Scandisk ve defrag gibi sistem araçları Donatılar sekmesinin altında bulunabilir.

#### Adım 6

Bilgisayarınızın ağır çalışmasını engellemek istiyorsanız, düzenli olarak bakımını yapın. Geri dönüşüm kutusunu boşaltın, kullanmadığınız çok yer kaplayan dosyalarınızı silin.

## MEASURING AND EVALUATION 2

1	A
2	C
3	C
4	A
5	B

### EVALUATION

Please compare the answers with the answer key. If you have wrong answers, you need to review the Learning Activity. If you give right answers to all questions, pass to the next learning activity

# RESOURCES

- Basic Technical English Jeremy Comfort, Steve Hick, Allan Savage Oxford University
- An Introduction to Technical English Thorn & Badrick Prentice Hall Phoenix ELT
- ENGLISH IN TECHNICAL ENGINEERING Aguado Perez Llantada Coleccion Textos Docentes
- Technical English Course Book Terry Phillips Cambridge International Book
- Basic Technical English. Student's Book Steve Hick, Allan Savage Oxford University