ملخص دروس Module: Technology Information منهج انسباير

تم تحميل هذا الملف من موقع المناهج الإماراتية

موقع المناهج ⇦ المناهج الإماراتية ⇦ الصف الثامن ⇦ علوم ⇦ الفصل الثالث ⇦ ملفات متنوعة ⇦ الملف

تاريخ إضافة الملف على موقع المناهج: 08-05-2025 09:59:06

المزيد من مادة علوم:	ملفات ا كتب للمعلم ا كتب للطالب ا اختبارات الكترونية ا اختبارات ا حلول ا عروض بوربوينت ا أوراق عمل منهج انجليزي ا ملخصات وتقارير ا مذكرات وبنوك ا الامتحان النهائي ا للمدرس
	إعداد: Emam-El Aya

التواصل الاجتماعي بحسب الصف الثامن

صفحة المناهج الإماراتية على فيسبوك					
المواد على تلغرام	التربية الاسلامية	اللغة العربية	اللغة الانجليزية	الرياضيات	

المزيد من الملفات بحسب الصف الثامن والمادة علوم في الفصل الثالث

1	مراجعة الدرس الأول الأحافير من الوحدة العاشرة أدلة على ماضي كوكب الأرض
2	أسئلة مراجعة شاملة منهج انسباير بدون الحل
3	أسئلة مراجعة درس الزلازل اختيار من متعدد
4	حل أسئلة الامتحان النهائي القسم الالكتروني منهج بريدج
5	حل أسئلة الامتحان النهائي القسم الالكتروني منهج انسباير

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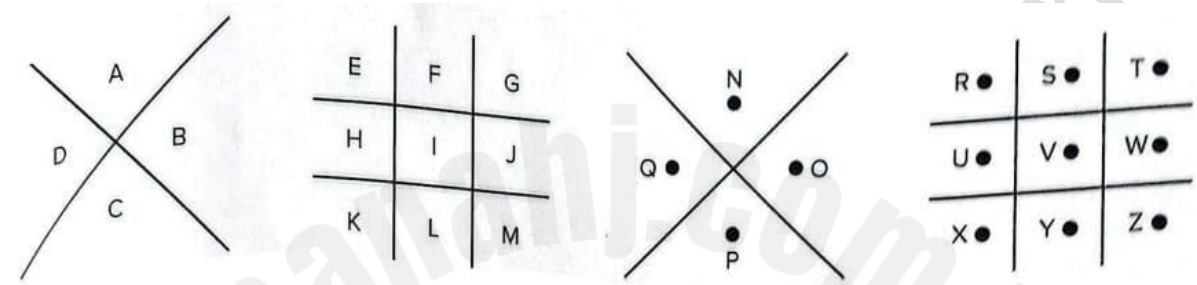
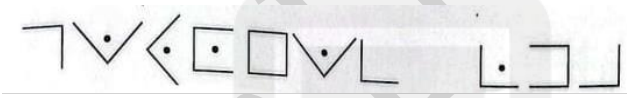
Module: Information Technology

Lesson1: Communicating with signals

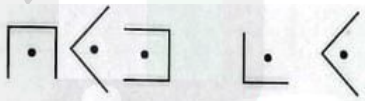
Can you understand the message in the photo on the left? What about in the space below? Use your understanding of codes to determine what the message says.



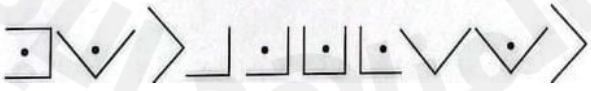


Knowing the

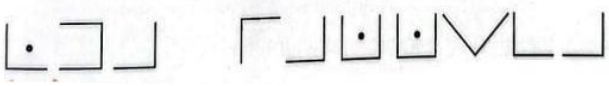
Code allows



You to



Understand



The message

What is a signal and how does it communicate?

signal is a piece of information that is communicated using the senses.

- Every time you speak you are using sound as a signal to communicate.
- People who use American Sign Language also use signals to communicate.

Sharing Information

What do verbal speech, braille, and printed English a text all have in common?

They are all different types of signals used to send information.
The method of how they are sent varies.

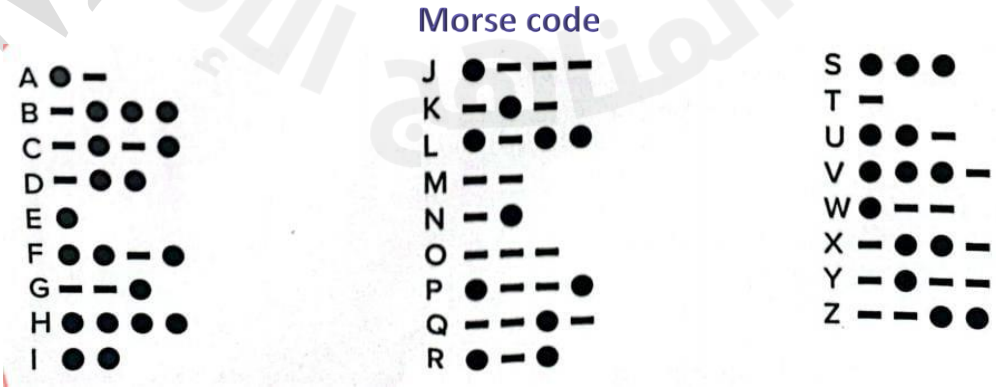
- Vocal cords send information encoded in pressure waves through the air.
- Reading this text on page requires a light source to reflect off the page in very specific unique patterns. Your brain interprets this as information encoded in text.
- Braille encodes information as arrangements of dots that are designed to be interpreted by touch (To send a signal the information is encoded ⟶ The signal is then sent, or transmitted. A receiver then interprets the signal)

Encoding Signals

A signal can be stored, encoded, or transmitted. To send a signal both the sender and the receiver of the information must understand how the signal was encoded.

An example of an encoded message:

1- when hikers leave a signal made from rocks and sticks to inform other hikers of trail dangers or directions. These signals can only be understood if the receiving hiker knows what the rocks and sticks mean.
2- Other examples of methods used to encode signals include Morse code and binary. Most communication devices, like computers, have built-in technology that encodes and decodes information automatically.



Transmitting Signals

Signals can also be transmitted or passed on. When you talk to another person, you are transmitting information, Signals can be transmitted long distances by using **electromagnetic waves** such as radio waves, microwaves, or light waves.

An advantage to transmitting information with waves:

1- Is that they do not permanently move matter.
2- They can also be varied in many ways to hold information.

One disadvantage of using waves to carry signals is that they lose energy as they travel through mediums. This reduces how far a message can be sent.

- Radios, phones, and televisions were developed to send or receive different signals carried by electromagnetic waves or electric signals.
- Electric signals are encoded in wave pulses and are carried by wires over long distances.
- Information such as computer data and telephone calls can be converted into electrical signals.
- The electronic signals for these devices travel at least part of the way through **optical fibers**.

https://youtu.be/jZOg39v73c4

Electromagnetic Waves

As research into electromagnetic waves has progressed, more technologies have used them as a method of communication, for a number of reasons:

1- Electromagnetic waves travel very fast (300.000 km/s).
2- Electromagnetic waves allow for fast communication over long distances, such as the video call shown in the image on the right.
3- Electromagnetic waves can also be modulated, or modified, to contain information.
   a- Wave modulation occurs by changing a property of the wave.
   b- Two ways to modulate a wave, are to change the wave's amplitude (AM).

What affects how well a signal is transmitted?

Sometimes when you are talking on a cell phone the signal is crystal clear, and other times you can barely understand the person.

Signal Noise

If you are standing next to your friend and she says something. you will hear her clearly. But what if she said the same thing across a noisy room? You might have to ask her to repeat what she said. Why? The other noises in the room interfered with the sound wave that you were hearing.

The same thing can happen in other types of information.

A photograph can become too bright when too much light is let into the camera.

Microphone feedback happens when electronic signals interfere with each other.

Noise is the unwanted modification of a signal.

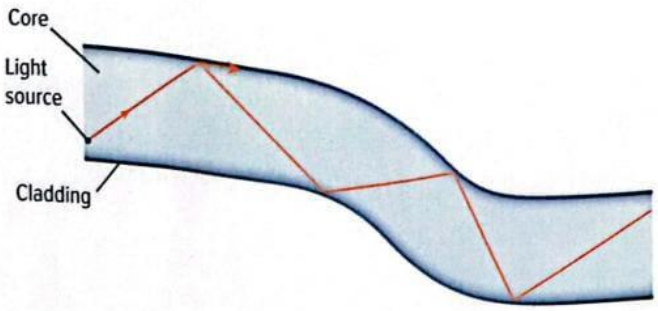
As a wave moves farther away from its source, it can mix with other signals, which causes slight variations in the original signal.

The source of the noise can be different for each signal, but the information in each of these signals will deteriorate as noise increases.

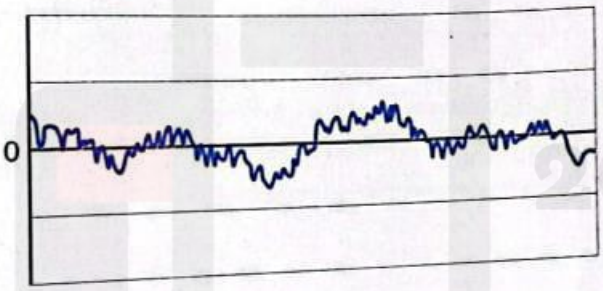
Clear sound

Noisy sound

Examine the model of how light travels through a fiber optic cable.



- **A light ray stays inside an optical fiber due to wave behaviors. Which behavior is not associated with optical fibers?**
  - A- Because of the wave behavior of reflection.
  - B- Because of the wave behavior of refraction.
  - C- Because of the wave behavior of diffraction.
  - D- Because of the wave behavior of transmission.



- **The wave shown in the graph above is affected by signal noise. How does this affect the quality of the wave?**
  - A- It increases the quality.
  - B- It decreases the quality.
  - C- The quality is not affected by noise.
  - D- It only affects the wave if you are far away from the source.

Lesson2: Modern Communication with digital signals

Analog Signal

What is an analog signal?

Cassette players are a type of tape drive. Tape drives are devices that can play and record data on a magnetic tape. Cassettes and cassette players are an example of an analog system. Film photography is another example.

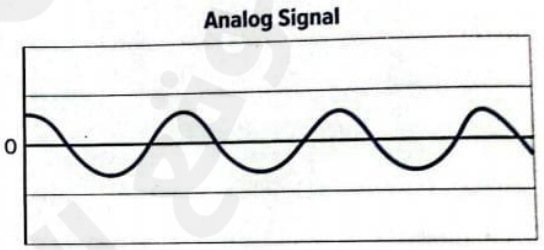
Analog Signals

Analog signals change continuously over time. For instance, think about an analog clock. The hands continuously move over the face of the clock.

The clock represents time and the thermometer represents temperature.

Analog signals are a representation of the information that is communicated. Until the introduction of computers, almost all instruments used for measuring were analog.

Notice that the analog signal in the figure to the right is a continuous smooth curve. Analog signals can have a range of values. Recall that **radio signals** are a type of signal that are transmitted. Radio signals are analog signals. The towers that send music to your radio at home send these signals through **electromagnetic waves**. The waves of a radio tower are a **continuous signal** that is translated by your home radio into sound waves.



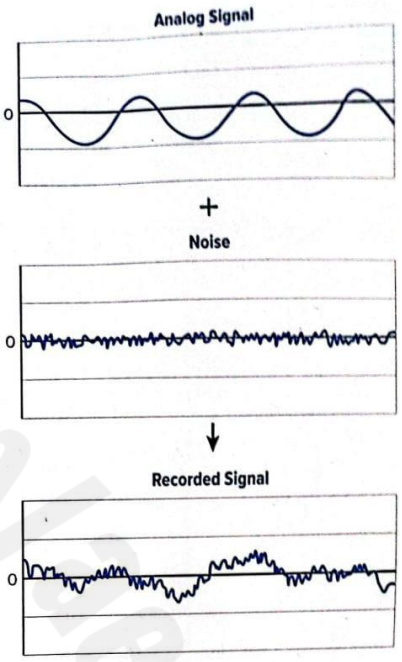
What happens to an analog signal over time?

An analog signal is **continuous over time.**

Analog Noise

Recall that **noise** is an unavoidable modification of a signal. When an analog signal is recorded, the noise is recorded along with the original signal.

Over time, noise accumulates and the information deteriorates. Think about a time that your home radio did not sound clear. The noise that the radio made is the result of noise accumulating on the original signal. The radio is translating the signal correctly, but the signal has changed from the original due to noise ⟶ This is why a tape drive sounds less clear than the music from a computer or portable media player. The noise in the signal has deteriorated the information stored on the tape drive over time.



Scientists have developed ways to filter noise out of analog signals.
However, when this is done the original signal is still altered ⟶
When the original signal is altered ⟶ the information contained in the signal becomes altered ⟶ This can result in a loss of quality from the original information.

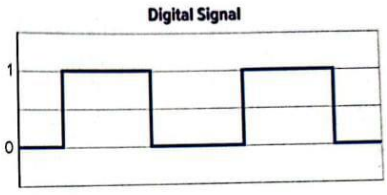
Digital Signal

What is a digital signal?

Today's society is moving toward a digital means of playing and listening to music.

Digital Signals

The digital thermometer displays discrete values. Examine the digital clock in the image to the right. The time is 9:27. The clock only changes when the time is 9:28. This is discrete information about the time of day.



Your digital thermometer gives discrete values for the temperature until the next value. (Digital information is not continuous).

A digital signal is an electric signal whose value changes between two values.

A digital signal **is not continuously** changing values like analog signals. The information being communicated is converted into numbers or digits to be displayed, transmitted through wave pulses. or stored.

Information such as computer data and telephone calls can be encoded into **electrical signals**. A signal to or from a computer is encoded into **binary numbers**, **such as** the two values-on (1) and off (0).

How does a digital signal encode information?

Digital signals are composed of only two possible values.

Binary Information

Information, **such as** computer date and telephone calls, can be encoded into electrical signals. A signal to or from a computer is encoded into binary numbers. Recall that a computer can translate information that is represented by 1s and 0s which represent on/off.

Computers can do much more than add numbers ⟶ They can show images, play music ⟶ format documents ⟶ and send digital signals to other computers. (The more inputs and outputs technology like a computer has the more information it can hold, and the more complex the calculations it can perform)

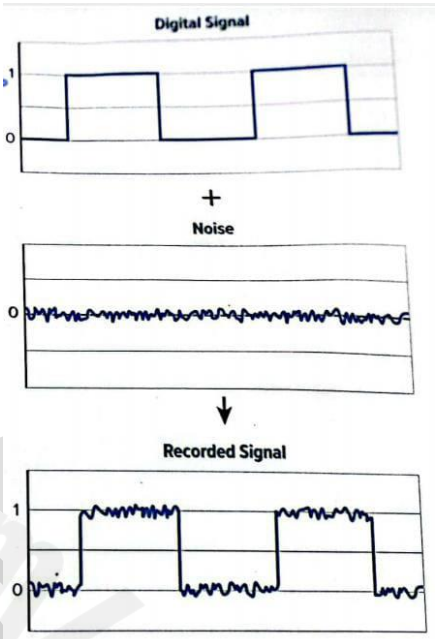
Think about a photo taken with a digital camera. A digital photo holds one color value at one particular location called a pixel ⟶ As more color values are added, the information becomes clearer.

Example, Look at the photos on the right. In the top image, the digital information exists, but it is not enough to make out what the image actually looks like. As more information is added, the photo becomes clearer.

For digital sensors and probes, information is continually reaching the sensor. Think about a digital camera. Light is continuously reaching the camera, but each pixel can hold only one value or color. The camera records each pixel in a process called **sampling**.

What happens to a digital signal over time?

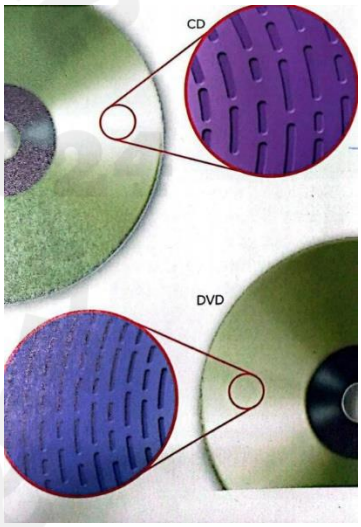
Digital Noise



Just like analog signals, when digital signals are sent, noise is added to the original signal.
Examine the figure to the right When noise is added to a digital signal, the information **can still be clear to the receiver.**
A device that receives and translates a digital signal is only expecting one of the two values, on or off. Noise then is easily filtered off without significant deterioration to the original information even when transmitted over long distances.

This makes digitized signals a more reliable way to encode and transmit information than analog signals.

Digital Storage



Digital information **such as** music is saved on CDs and DVDs as tiny pits and lands. The pits (holes) represent 0s and the lands (space between holes) represent 1s Information stored digitally resists degradation because there are only two possible states.

Even if the disc deteriorates somewhat, a disc reader will likely still be able to distinguish between pits and lands.
the device that recalls the information must be able to translate a digital signal.
This is why you cannot place a DVD into a CD player. The CD player is not designed to decode the Information on a DVD.

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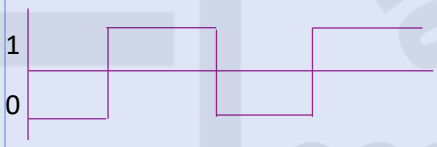
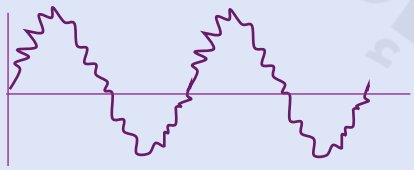
How does digital technology advance science and science investigations?

Digital Probes

Space telescopes are not the only place that digital information is useful. **Digital thermometers**, are used by scientists to measure accurate data about temperature.

1- Almost all probes and scientific measurements today use digital technology.
2- Digital audio recordings help scientists understand what is happening beneath the ocean.
3- Digital sensors are used in particle accelerators to understand what is happening at the smallest levels of matter.
4- Digital signals sent by the Mars rovers told scientists about the planet's composition.

Analog Signal	Digital Signal
	
▪ Continuous signal **Ex:** - Analog signal - Analog thermometer - Cassette players - Film photography ▪ Range of values ▪ Noise causes deterioration on the original sound. 	▪ Not continuous signal **Ex:** - Digital clock - Digital thermometer ▪ Only two values 0, 1 ▪ Noise doesn't cause deterioration on the original sound.