SPECIAL PROGRAM IN TECHNICAL VOCATIONAL EDUCATION (SPTVE)
COMPUTER SYSTEMS SERVICING 9 Q3-W2

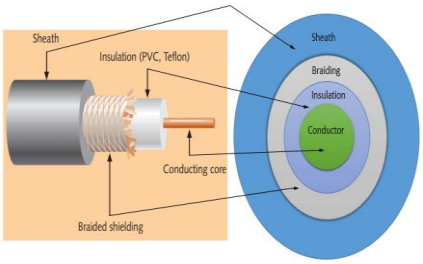
I. Topic: Network Cable Types and Specifications

II. Objectives:

1. explains the types of network cables used in computer network;
2. differentiate specifications, standards, and features of the coaxial cable, twisted-pair cable, and the fiber-optical cable and;
3. Identify the features and specifications of network cable.

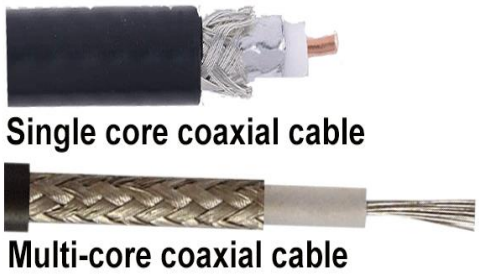
III. Brief Introduction of the Lesson

To connect two or more computers or networking devices in a network, network cables are used. There are three types of network cables; coaxial, twisted-pair, and fiber-optic.



Coaxial cable

This cable contains a conductor, insulator, braiding, and sheath. The sheath covers the braiding, braiding covers the insulation, and the insulation covers the conductor.



The following image shows these components.

Sheath,**Braided, shield-Insulation** and **Conductor**-uses a single central metal while a multi-core coaxial strands of metal wires.

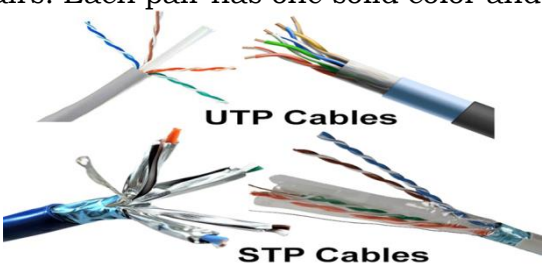
Specifications of coaxial cables

Coaxial cables have been in use for the last four decades. During these years, based on several factors such as the thickness of the sheath, the metal of the conductor, and the material used in insulation, hundreds of specifications have been created to specify the characteristics of coaxial cables.

Twisted-pair cables

The twisted-pair cable was primarily developed for computer networks. This cable is also known as **Ethernet cable**. Almost all modern LAN computer networks use this cable.

This cable consists of color-coded pairs of insulated copper wires. Every two wires are twisted around each other to form pair. Usually, there are four pairs. Each pair has one solid color and one stripped color wire. Solid colors are blue, brown, green and orange. In stripped color, the solid color is mixed with the white color.



Based on how pairs are stripped in the plastic sheath, there are two types of twisted-pair cable; UTP and STP.

In the **UTP (*Unshielded twisted-pair*) cable**, all pairs are wrapped in a single plastic sheath.

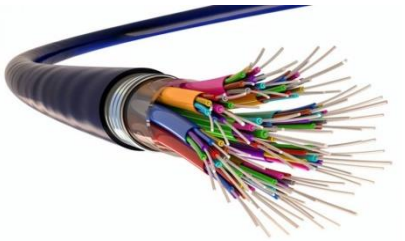
In the **STP (*Shielded twisted-pair*) cable**, each pair is wrapped with an additional metal shield, then all pairs are wrapped in a single outer plastic sheath.

The TIA/EIA specifies standards for the twisted-pair cable. First standards were released in 1991, known as **TIA/EIA 568**. Since then, these standards have been continually revised to cover the latest technologies and developments of the transmission media.
The TIA/EIA 568 divides the twisted-pair cable into several categories. The following table lists the most common and popular categories of the twisted-pair cable.

- Cat 1, 2, 3, 4, 5 are outdated and not used in any modern LAN network.
- Cat 7 is still a new technology and not commonly used.
- Cat 5e, 6, 6a are the commonly used twisted-pair cables.

Fiber optic cable

This cable consists of core, cladding, buffer, and jacket. The core is made from the thin strands of glass or plastic that can carry data over the long distance. The core is wrapped in the cladding; the cladding is wrapped in the buffer, and the buffer is wrapped in the jacket.



- Core carries the data signals in the form of the light.
- Cladding reflects light back to the core.
- Buffer protects the light from leaking.
- The jacket protects the cable from physical damage.

SMF (Single-mode fiber) optical cable

This cable carries only a single beam of light. This is more reliable and supports much higher bandwidth and longer distances than the MMF cable.

MMF (multi-mode fiber) optical cable

This cable carries multiple beams of light. Because of multiple beams, this cable carries much more data than the SMF cable.

IV. Activities:

Activity 1

Directions: Research on the different types of cable and write your answers on a separate sheet of paper using the following guides:

1. Using the Internet, research the three types of cables used in networking.
2. Write a short description of the companies and list their cable products and prices.
3. Compare the prices and determine which cable is best in networking.
4. Create a table or spreadsheet to accompany your description that calculates and/or displays the average cost of each cable type for the companies you have researched.
5. List your web site resources including the URL for each site.
6. Write the specifications of each cables.

Scoring Guide

CRITERIA	%	**YOUR SCORE**
Types of cable used in networking	10	
Use of Web resources	15	
Specification of cables	25	
Differentiates types of cables	50	
TOTAL	100	

Activity 2

Directions: Give the definitions of the following.

1. Coaxial cable-

_____

2. Single-core coaxial -

_____

3. Twisted-pair cables -

_____

4. UTP (Unshielded twisted-pair) cable-

_____

5. STP (Shielded twisted-pair) cable -

_____

6. TIA/EIA 568 -

_____

7. Fiber optic cable -

_____

8. SMF (Single-mode fiber) optical cable -

_____

9. MMF (multi-mode fiber) optical cable-

_____

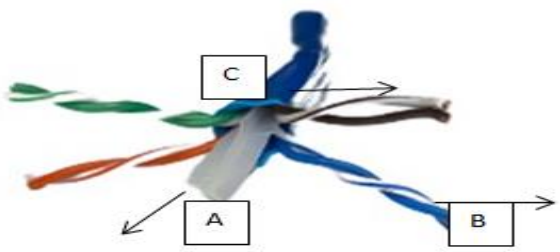
10.Ethernet-

_____

Activity 3

A-Name the parts of Coaxial Cable and give its function.

B-Name the parts of Ethernet Cable and give its function.



V. Assessment:

Directions: Encircle only the letter of the correct answer.

1. Type of copper wire that connects home and many business computers to the telephone company?
   A. Unshielded Twisted Pair (UTP)
   B. CAT5 E
   C. Coaxial
   D. Twisted Pair

2. What are two types of Twisted Pair? (Select two answers)
   A. Broadband
   B. Shielded Twisted Pair
   C. Fiber Optic
   D. Unshielded Twisted Pair

3. Coaxial cables are not susceptible to noise or _____ blank?
   A. Breakage
   B. Transmission
   C. Damage
   D. Electrical interference

4. What type of cables consist of a core of glass or plastic which carries the signal?
   A. Fiber optic
   B. Coaxial cable
   C. Unshielded Twisted Pair
   D. Shielded twisted pair

5. Why are wires in twisted pair cables?
   A. To reduce crosstalk or electromagnetic induction between pairs of wires
   B. Not To reduce crosstalk or electromagnetic induction between pairs of wires
   C. Because they cost less
   D. All of the above

VI. Reflection:

In all types of cable mentioned, which one is cheapest, easy to install and most effective to use in networking? Why?

References:
1. https://www.computernetworkingnotes.com/networking-tutorials/network-cable-types-and-specifications.html
Date retrieved: January 5, 2021
2. https://www.boltontechnical.co.za/blogs/news/understanding-coaxial-cables-the-complete-guide
Date retrieved: January 5, 2021
3. https://quizizz.com/admin/quiz/5e1e9f015941b8001b8b4d61/ethernet-cables
Date retrieved: January 5, 2021

Writer: Eddie I. Villamor

Validator: Gregorio S. Quineri