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ENGLISH FOR SKILLS 2

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VOCATIONAL ENGLISH FOR ICT

TIRANA, MARCH 2013

ENGLISH FOR SKILLS 2

Vocational English for ICT

British Council Albania
TIRANA, APRIL 2013

INTRODUCTION

English Language is a vital part of our work in British Council; British Council delivers it throughout different initiatives and collaborations with local and international partners.

English language acquisition and Vocational Education and Training, ICT remain the main priorities of Ministry of Education and Science in Albania and also British Council Albania. Each of them aims at a better Education system and compatible with European standards.

Strengthening the education and vocational training, restructuring it according to the requirements of the domestic labour market and wider, adaptation to EU standards and developments as well as increase of the number of students are the priorities of our education system.

The second phase of " English for Skills" project reaffirmed the cooperation between the Ministry of Education and the Science with British Council and the success of the first phase of the project. The success of the first phase was clearly confirmed by students, teachers and school as a document which brought positive changes in their every day teaching and learning process aiming a better and more modern education system.

The product of the second phase "English for Skills 2" is planned as a revised practical format of the curricula for students of grade XIII of Vocational Highs Schools, ICT branch. The "English for Skills 2" introduced new aspects in the field of linguistic objectives and in the field of IT.

This kit is the final product of this project and contains :

- Global and specific linguistic objectives for students of grade XIII.
- The continuation of the structure of curricular documents for English language for grade XIII
- Every day preparation structure for teachers of these schools introducing language skills an focusing to learners needs
- Teaching materials composed of technical and literary materials for ICT topics, links to download materials and improve searching and listening abilities.
- Two types of assessment, formative or progress assessment and summative or final testing.

The project "English for Skills 2" proved once again :

- The ability of our experts to work with the same pace and professionalism with international experts to improve language learning and bringing it closer to the requirements of market economy.
- A further communication between the ICT specialists and the English teachers in order to prepare students for the world of work.

Daniela Nuredini
Program Manager
British Council

Tatjana Vuçani
Project coordinator
Ministry of Education and Science

Acknowledgements
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LEARNING OBJECTIVES

Language Objectives

The "English for Skills 2" program is planned as a revised practical format of the curricula for students of Vocational Highs Schools, ICT branch.

At the end of the grade XIII students will be able to globally achieve the communicative language competences at the B2 level (independent user) according to the standards described at the Common European Framework of Reference for Languages.

Respecting students overall growth and their vocational orientation at the end of grade 13 they :

- Can understand the main ideas of the complex text on both concrete and abstract topics, including technical discussions in her/his field of specialization.
- Can interact with a degree of fluency and spontaneity that makes regular interaction with native speakers quite possible without strain for the other party.
- Can produce clear, detailed text on a wide range of subjects and explain a view point on a topical issues giving the advantages and disadvantages of various options.

The above CEF reference scale (B2) allows students to achieve the following abilities:

1. Can use the right repertoire according to the situation while communicating in a foreign language.
2. Can apply technical means of communication as well as knowledge gained from other learning objects\means.
3. Can use English language in specific professional environment in oral or written form.
4. Can reproduce in English what according to a given criterion is the essence of an important professional text in English
5. Can summarize and comment in English a text of professional importance.
6. Can recognize economic, political, ecological, social and cultural facts of English-speaking countries to the extent that concerns their every day and professional life.
7. Can present and compare the Albanian culture with English culture.
8. Can use the vocabulary or phraseology related to field of interest TIC (information technology) related to the given situation in oral or written form.
9. Can write in English issues linked with business correspondence.
10. Can develop self-confidence, independence, and positive attitude towards the business English being able to present and explain a product and its functions; introduce their own business, be able to assist and solve the professional situations linked with ICT
11. Can master standard situations on the phone, write messages, transmit correctly numbers and dates, fix appointments and provide information about products, company, the service status.
12. Can prepare their own CV, apply for a job vacancy, have a job interview, develop simple reports in standard English.
13. Can manage situations linked in the field of Front –Office- help-desk like the attention and support for the client.

GRADE XIII:

Subject: English for ICT

Topics for communication:
Technology of communication, society, culture, international relations, present situation.
Language abilities:
Deepening and extending\expand language abilities already learned paying always attention or stressing language autonomy

Language structures:
Deepening and extending\ expand language structures.

Business Communication:
Strengthening and expanding business communications language learned so far; application in situations related to the profession (eg job application, business trip, preparing an order forma, making lists;); seeking expertise about complex business cases

Language strategies:
Strengthening and expanding current linguistic acquisition techniques.
Thorough communication that goes beyond individual subjects areas.
Communicating in cross curricular subject areas

Team working:
Collection and selection of materials; the importance of information; enhancing and deepening of cross cultural skills,

Beyond subject preparation:
Preparation for international certificates; participations and project design; preparation for in and abroad internships

ICT connection
Writing and designing texts and documents to be presented by computer. Finding, sharing information in the intranet / internet; writing and preparing business correspondence using computer programs; Using software programs

Assignment:
Every two to three weeks assuagement.

1. **IT Objectives**

Chapter I: Computer networks
- Explain differences between computer networks(LAN, WAN)
- Analyze peer to peer networks
- Describe proper environment using peer to peer network
- Explain the network client- server; advantages and disadvantages
- Describe types of servers and their functions

Chapter II: Computer networking topologies
- Explain the term “topology”
- Describe the “topology”, and make the difference between several topologies
- Describe their mixed forms

Chapter III: Media and cable transmission
- Describe the STP cable
- Describe the UTP cable
- Analyze the physical structure of the coaxial cable
- Describe the optic fibers, advantages and disadvantages

Chapter IV: Active network components
- Distinguish the active components of the network
- Explain their function differentiation based on OSI model
- Distinguish Hubbs from switches

PROGRAMME: ENGLISH FOR SKILLS - VOCATIONAL ENGLISH WITH ICT

TIME	TOPIC/ CONTEXT	LEARNING OBJECTIVES/ OUTCOMES			TEACHING AND LEARNING METHODS	RESOURCES	ADDITIONAL INFORMATION AND WEB LINKS
		Grammar/ Function	Speaking/ Listening	Reading/ Writing			
Week 1	**COMPUTER NETWORKS** Differences between computer networks (LANs & WANs)	Connecting words expressing contrast: while, whereas, on the other hand) Specialist lexis – computer networks Acronyms Discourse markers to structure formal speech	Compare & contrast Explain meaning of specialist nouns Group presentation on advantages of networks Listening for specific information	Reading for Specific Info Identifying & writing topic sentences Summarizing main points in text	Vocabulary focus: Networks Whole group language focus Cloze exercise Comprehension: Qs & As Supporting video Matching pairs (words / definitions) Small groups: presentations	http://www.differenceb-etween.net/technology/difference-between-lan-and-wan/ http://www.computerworld.com/s/article/341095/Mesh_Networks http://www.youtube.com/watch?v=tYLU755T6_I	http://www.bbc.co.uk/learningzone/clips/computer-networks-lan-and-wan/ http://www.bbc.co.uk/bitesize/standard/computing/comms_networks/lan/revision/1/
Week 2	**COMPUTER NETWORKS** Peer-to-peer networks & virus control	*If*-clauses to express action and effect	Action & effect Listening for specific information	Reading for specific info Group writing a persuasive poster Summarizing advantages & disadvantages (P2P networks) Use of connecting words to express action & effect	Whole group language focus Comprehension multiple-choice Supporting video	http://www.bbc.co.uk/schools/gcsebitesize/ict/implications/virusesrev1.shtml http://www.bbc.co.uk/apps/ifl/schools/gcsebitesize/ict/quizengine?quiz=viruses;templateStyle=ict)	www.techterms.com http://compnetworking.about.com/od/basicnetworkingfaqs/a/peer-to-peer.htm www.youtube.com/watch?v=c34QwtYl40g http://news.bbc.co.uk/1/hi/technology/3409187.stm

TIME	TOPIC / CONTEXT	LEARNING OBJECTIVES / OUTCOMES			TEACHING AND LEARNING METHODS	RESOURCES	ADDITIONAL INFORMATION AND WEB LINKS
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Week 3	**COMPUTER NETWORKS** Client Server **Networks (CSN)**	Gerunds / infinitives	Defining technical terms Comparing / contrasting CSN /P2P	Reading for specific information Summarizing the advantages and disadvantages of CSN & P2P	Jigsaw reading Comprehension Qs & As Read & abstract important information (advs & disadvs) Whole group: language focus	http://www.functionx.com/networking/Lesson06.htm	http://youtu.be/YJBBo0NqXyA http://www.teach-ict.com/gcse_new/networks/peer_peer/home_peer_peer.htm
Week 4	**COMPUTER NETWORKS** Functions of the server on the network	Infinitives of purpose Ex. The aim of...is	Summarizing information Expressing opinions	Summarizing information Writing a text describing function of an email server	Read to abstract important information Class discussion on benefits of different types of networks.	www.wisegeek.com/what-is-a-**network-server**.htm	http://youtu.be/xsZpND_iRKA
Week 5	**TOPOLOGIES OF COM-PUTER NETWORKS** History	Verb + preposition combinations	Qs & As on history of topology Develop fluency by participating in discussion Explaining function using visual representation	Analyse and describe data from a diagram Reading for specific information Identifying key points in text and writing a summary	Whole group Language focus Comprehension Qs & As / multi-choice	www-**history**.mcs.st-and.ac.uk/.../**Topology**_in_mathematics.html	http://www.youtube.com/watch?v=zsN_guq__Ac http://youtu.be/an-ZgJV4WvY

TIME	TOPIC / CONTEXT	LEARNING OBJECTIVES / OUTCOMES			TEACHING AND LEARNING METHODS	RESOURCES	ADDITIONAL INFORMATION AND WEB LINKS
		Grammar/ Function	Speaking/ Listening	Reading/ Writing			
Week 6	**TOPOLOGIES OF COM-PUTER NETWORKS** Bus topology Star topology	2nd conditional for possible effect (and suggesting solutions) Conguncti ons	Comparing topologies (Ring & Tree). Providing an explanation on how they work	Reading for specific information Providing solutions to possible problems of the networks.	Whole group language focus Comprehension-multiple-choice/ true & false Game	ttp://www.bbc.co.uk/schools/gcsebitesize/ict/datacomm/networktopsrev1.shtml http://www.youtube.com/watch?v=ySd-k7i7G5k&list=UUwkrK5O1Nr6TXoCSK3u9zDw&index=2 http://www.youtube.com/watch?v=Awt4ikvFYyI	http://youtu.be/cmYa0c-5h7w http://www.youtube.com/watch?v=X221CtO5NQA
Week 7	**TOPOLOGIES OF COM-PUTER NETWORKS** Ring topology Tree topology	2nd conditional for possible effect (and suggesting solutions) Nouns + suffixes	Comparing topologies (Ring & Tree). Providing solution to hypothetical problem	Reading for specific information Providing solutions to possible problems of the networks.	Whole group language focus Comprehension-multiple-choice/ true & false Game	http://www.bbc.co.uk/schools/gcsebitesize/ict	http://youtu.be/dOHpbT-2IJA http://it.toolbox.com/wiki/index.php/Ring_Topology
Week 8	**TOPOLOGIES OF COMPUTER NETWORKS**	Indirect questions Making recomm-endations Expressing ability 'can' and 'be able to'	Providing the advs / disadvs of hybrid topology [Identify & label diagrams of topologies based on listening] Present & justify an opinion	Reading for specific information Structure essay using thesis statement and concluding paragraph	Comprehension Qs & As Whole group language focus Role play	http://www.ianswer4u.com/2012/05/hybrid-topology-advantages-and.html#ixzz2H6SgTogt	http://youtu.be/TrcYpvgzX28 http://youtu.be/f0jCEvoR7sc
Week 9	**CABLE TRANSM-ITION MEDIA** Copper cable transmission technique	Ordering of adjectives Adjectives + suffixes Reviewing word families	Listening for and giving instructions Describing the functions of different cables	Reading for specific information. Online activities and tests Writing a descriptive paragraph	Whole group language focus Dictionary work	http://youtu.be/LKPuzaJHW00	http://www.ictglobal.com/trans_types.html

TIME	TOPIC / CONTEXT	LEARNING OBJECTIVES / OUTCOMES			TEACHING AND LEARNING METHODS	RESOURCES	ADDITIONAL INFORMATION AND WEB LINKS
		Grammar/ Function	Speaking/ Listening	Reading/ Writing			
Week 10	**CABLE TRANSMI-TION MEDIA** Categories of cables (UTP/ STP)	Present participle(ing)-past participle (ed) used as adjectives Review degrees of adjectives Specialist lexis: categories of cables	Listening for specific information Comparing and contrasting cables	Scanning a technical text Write a list of instructions on how to fix cables	Whole group presentation & demonstration of how to fix a cable Jigsaw reading Supporting video	http://www.youtube.com/watch?v=hvnH5qd0QSE http://youtu.be/EH9zlCZe1qA	http://pluto.ksi.edu/~cyh/cis370/ebook/ch02b.htm http://www.greenpeak.com/company/Management.html
Week 11	**CABLE TRANSMI-TION MEDIA** Categories of cables (coaxial cable)	So/such Revision of passive voice Revision of narrative tenses Passives Specialist vocabulary	Qs & As on history of cable television in USA Describing events Expressing opinions Listening for / specific information	Reading gap-fill text “ Reading short history of coaxial cable to identify specific vocabulary	Gap fill reading Whole group language focus Supporting video Small group discussions	http://youtu.be/nKEvciE5G7c http://www.youtube.com/watch?v=fxHXPltuZ74	www.howstuffworks.com/cable-tv.htm http://www.teachingenglish.org.uk/lesson-plans/telling-a-story
Week 12	**CABLE TRANSMI-TION MEDIA** Optical Fiber transmission technique (FO)	Revision of conditionals & imperatives Verb +preposition combinations	Giving guidelines on installing cables Listening for specific information Giving opinions by providing relevant explanations, arguments and comments	Reading for general understanding Writing guidelines Writing a report	Comprehension multiple choice Small group activity; demonstration on installing cables Class debate Mini-test	http://youtu.be/0MwMkBET_5I http://www.bbc.co.uk/schools/gcsebitesize/ict/implications/3healthandsafetyrev1.shtml http://www.youtube.com/watch?v=T8qGO7XQ0Uw	http://www.ictglobal.com/trans_types.html http://www.teachingenglish.org.uk/great/innovation-great http://www.teachingenglish.org.uk/activities/inventions
Week 13	**ACTIVE COMPO-NENTS OF THE NETWORK** Switch Repeater	Revision of narrative forms Specialist vocabulary Asking for / giving advice	Asking / answering questions on text Listening for the main ideas	Reading text & matching headings with paragraphs Reading for specific information Writing a summary using Spiderscribe	Comprehension Online activities and tests Supporting video	http://youtu.be/S2AHimvbovI http://youtu.be/GiyVDpY8WI0	http://youtu.be/reXS_e3fTAk http://highered.mcgraw-hill.com/sites/0072967757/student_view0/chapter15/multiple_choice_quiz.html

TIME	TOPIC / CONTEXT	LEARNING OBJECTIVES / OUTCOMES			TEACHING AND LEARNING METHODS	RESOURCES	ADDITIONAL INFORMATION AND WEB LINKS
		Grammar/ Function	Speaking/ Listening	Reading/ Writing			
Week 14 14	**ACTIVE COMPO-NENTS OF THE NETWORK** Bridge Router	Adverbs of frequency acronyms Phrasal verbs (telephone language)	Listening for specific information Role play asking for / giving advice on the telephone	Reading for detail Producing a poster using Glogster.	Comprehension - True/False Supporting video Role play	http://youtu.be/luOFxh1awiA http://www.teachingenglish.org.uk/activities/using-glogster-creating-interactive-online-posters	http://youtu.be/-S4yCzP12jA http://www.youtube.com/watch?v=E2G3ZFGDI_Y http://www.ictglobal.com/faq3.html#FAQ4
Week 15 15	**ACTIVE COMPO-NENTS OF THE NETWORK GATEWAY**	Revision of reported speech (affirmative sentences) Words with more than one meaning Specialist vocabulary	Listening to interview of Bill Gates & summarizing opinions Giving / asking for opinions Listening for gist	Bill Gates "interesting facts and coolest quotes" (change into reported speech) Taking down notes	Supporting video Comprehension Qs & As Matching exercise	http://youtu.be/R1mGgIKIEBY http://youtu.be/aQku6GTiW7U	http://youtu.be/RbY8Hb6abbg http://www.youtube.com/watch?v=AP5VIhbJwFs
Week 16 16	**ACTIVE COMPO-NENTS OF THE NETWORK** Network cards	Revision of Reported Speech (question and orders) Discourse markets to structure formal speech. Stating opinions Agreeing/ disagreeing	Comparing and contrasting Speaking about the life of successful people Listening to Steve Jobs on rules for success Class debate	Writing 10 rules on becoming successful Writing a cover letter Reading for general understanding	Jigsaw reading Group work Research Whole class discussion/ debate Supporting video	http://youtu.be/KuNQgIn6TL0 see example resources http://www.teachingenglish.org.uk/lesson-plans/ebookssee example resources on how to write a cover letter	http://www.ehow.com/video_5361853_install-satellite-dish.html http://youtu.be/1WxZ2Zk3v5Y http://youtu.be/Tz2d17gWZnc http://www.youtube.com/watch?v=KuNQgIn6TL0 http://video.about.com/esl/Learn-ESL--How-to-Write-a-Cover-Letter.htm
Week 17 17	**Formative Assessment X 3** • Week 4 • Week 8 • Week 12						
Week 18 18	**Summative Assessment** • English in Use • Reading • Writing						

WEEK 1/ 2 TOPIC: COMPUTER NETWORKS (LANS, WANS & PEER-TO-PEER)

Learning objectives: By the end of the lesson students will be better able to:

1. Identify and explain the differences between computer networks (LANs & WANs)
2. Use discourse markers (on the other hand, while, whereas) accurately in writing to contrast LANs & WANs
3. Identify and understand the role of topic sentences in written text.
4. Produce a written summary using discourse markers (on the other hand, while, whereas)
5. Define the distinguishing features of a mesh network and a Peer-to-Peer network.
6. Identify the advantages and disadvantages of (wireless) mesh networks by extracting appropriate information from a reading and / or listening.
7. Use a limited range of discourse markers to structure formal speech (to begin with, moreover, consequently, additionally, in conclusion)
8. Participate in a group presentation offering a solution to a computer network scenario and giving clear supporting reasons.
9. Identify acronyms related to computer networks.
10. Read a text for specific information on different types of viruses.
11. Accurately use if-sentences for action and effect in writing about the role of anti-virus.
12. Prepare a persuasive poster

Activity	Differentiation	Interaction	How learning will be checked / assessed
1. Introduce learning objectives – explain learning outcomes.	Additional set of Qs for faster Ss	T-Ss Ss-Ss	Elicitation technique
2. Reading What is a network? • Pre-reading: T asks questions to activate schemata. (Either in open class or pair work). • Ss read texts (1 & 2) (*What is a network?/ LANs & WANs)* and complete gap fill to check understanding of key specialist vocabulary. • Ss read text (3) *(What are the differences between LANs & WANs)* and answer Qs.	Additional set of Qs for faster Ss Pairs (weak/strong Ss)	Ss-Ss T-Ss Ss-Ss	Monitoring & Feedback Monitoring Qs& As
3. Language work (contrasting facts/ideas) • T introduces discourse markers (on the other hand, while, whereas). Draws Ss attention to their use in text (3) *(What are the differences between LANs & WANs)*, and explains their use and function. • Ss complete written exercises in pairs.	Pairs (weak/strong Ss) Pairs (weak/strong Ss)	T-Ss Individual Ss Ss-Ss	Monitoring & feedback Monitoring & Feedback
4. Writing: Topic sentences on the advantages/ disadvs of networks. • T elicits role of topic sentences in written text. • In pairs Ss underline topic sentences in text (3) *What are the differences between LANs & WANs?* • Ss summarize the differences between a LAN and a WAN using topic sentences and discourse markers (*on the other hand, while, whereas)* [This can be completed for homework]	Pairs (weak/strong Ss)	Pairs Individual Ss Individual Ss	Monitoring & language input Qs & As Monitoring & feedback
5. Specialist Vocabulary • Ss match acronyms with their meanings	Gap fill for weaker Ss	Ss-Ss	Monitoring & feedback
6. Reading: Mesh Network: These self-healing nets are fast & reliable • **Pre-reading task: Vocabulary check** In pair Ss match specialist vocabulary on mesh networks to correct definition • Ss read text and complete gap fill to produce a definition of a mesh network.	Additional Qs for faster Ss.	T-Ss Ss-Ss Pairs Ss-Ss T-Ss Ss-Ss	Monitoring & Feedback Elicitating & language / pronunciation correction

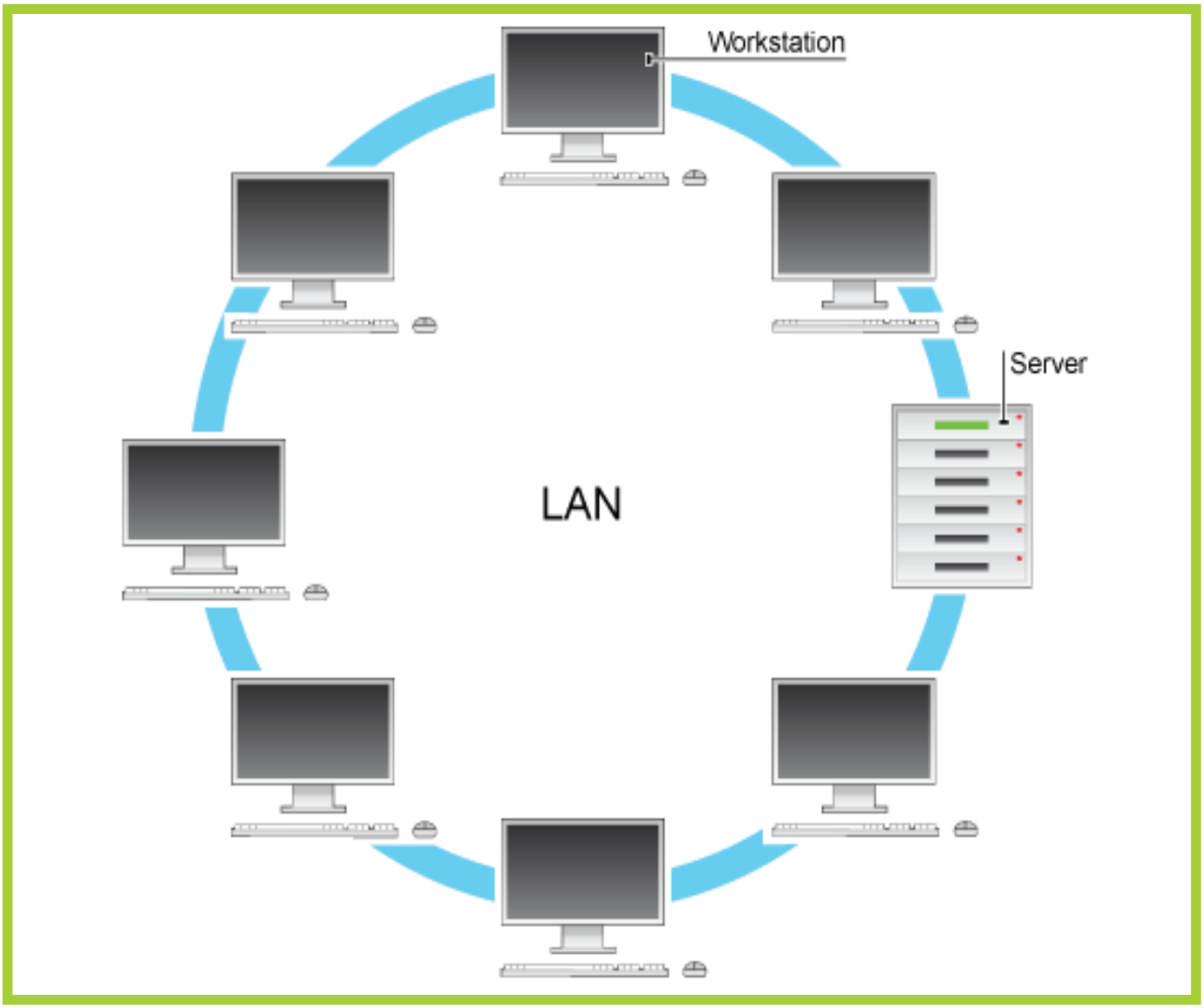
Activity	Differentiation	Interaction	How learning will be checked / assessed
7. **Video: How mesh networks work** • Ss watch video (recycles specialist vocabulary from reading above) and make notes on the advantages/disadvantages of mesh network. • Class discussion on the latest developments in wireless networks. 8. **Reading Advantages/Disadvs of networks.** • T ellicits what Ss remember about LANs & WANs from previous lesson. • T asks pre-reading question to activate schemata. *What advantages do you think networks have over standalone computers?* • In pairs Ss order laminated sentences according to advs/disadvs of networks. • Ss answer true/false questions. **9. Speaking: Group Case study** • T sets up scenario • In groups Ss work out the solution to a work-based situation.T provides input on appropriate key language. • Ss are given laminated cards with discourse markers to structure formal speech *(to begin with, moreover, consequently, additionally, in conclusion).* Ss decide where to use this in their presentations. • Ss present solution to the scenario to whole class / or to other group. Ss listen for use of the discourse markers. **10. Reading: BBC GCSE Bitesize: ICT viruses** • Pre-reading activity –T asks questions to activate schemata. (Either in open class or pair work). • Ss read text and answer multiple-choice questions. (This can be done either on-line or paper-based) **11. Language activity (*if sentences* for action & effect)** • Sts practice writing *if*-sentences describing anti-virus software, using information from the reading & multiple-choice questions. **12. Utube listening activity on viruses, worms & bots** • Could also be used either before the above reading or for self study by the Ss • Ss makes notes on the different viruses. **13. Writing: Persuasive Poster** • In small groups Ss prepare a poster persuading Ss to use anti-virus software. They use the vocabulary and grammar practised in the lesson. T inputs with persuasive words used in advertising. • Posters are displayed and Ss vote for most persuasive poster. **14. Reading Viruses turn to peer-to-peer nets & defining the Peer-to-Peer model** • T elicits what Ss know about the Peer-to-Peer model • Sts read article • Sts complete gap fill and define peer-to-peer model	Group work (mixed ability) Supported sentences for weaker Ss Gap fill for weaker ss Group activity (strong / weaker Ss) Additional Qs for faster Ss	Ss-Ss Ss-Ss T-Ss Individual Ss Individual Ss Individual Ss Ss-Ss T-S Individual Ss	Qs & As Monitors Qs & As T monitors & inputs key language when necessary Provides feedback Qs & As Monitoring & feedback Monitoring Qs & As Monitoring & language in-put Monitoring & feedback
HOMEWORK:	Summarize the differences between a LAN and a WAN by using topic sentences and discourse markers (on the other hand, while whereas).		

WHAT IS A NETWORK?
DIFFERENCE BETWEEN LANs AND WANs

(1) What is a network?
A network is simply two or more computers linked together. It allows users to share not only data files and software application, but also hardware like printers and other peripherals.

(2) LANs and WANs
There are two main types of network:
Local Area Network (LAN)
Wide Area Network (WAN)

LAN
A LAN covers a small area such as one site or building, eg a school or a college.

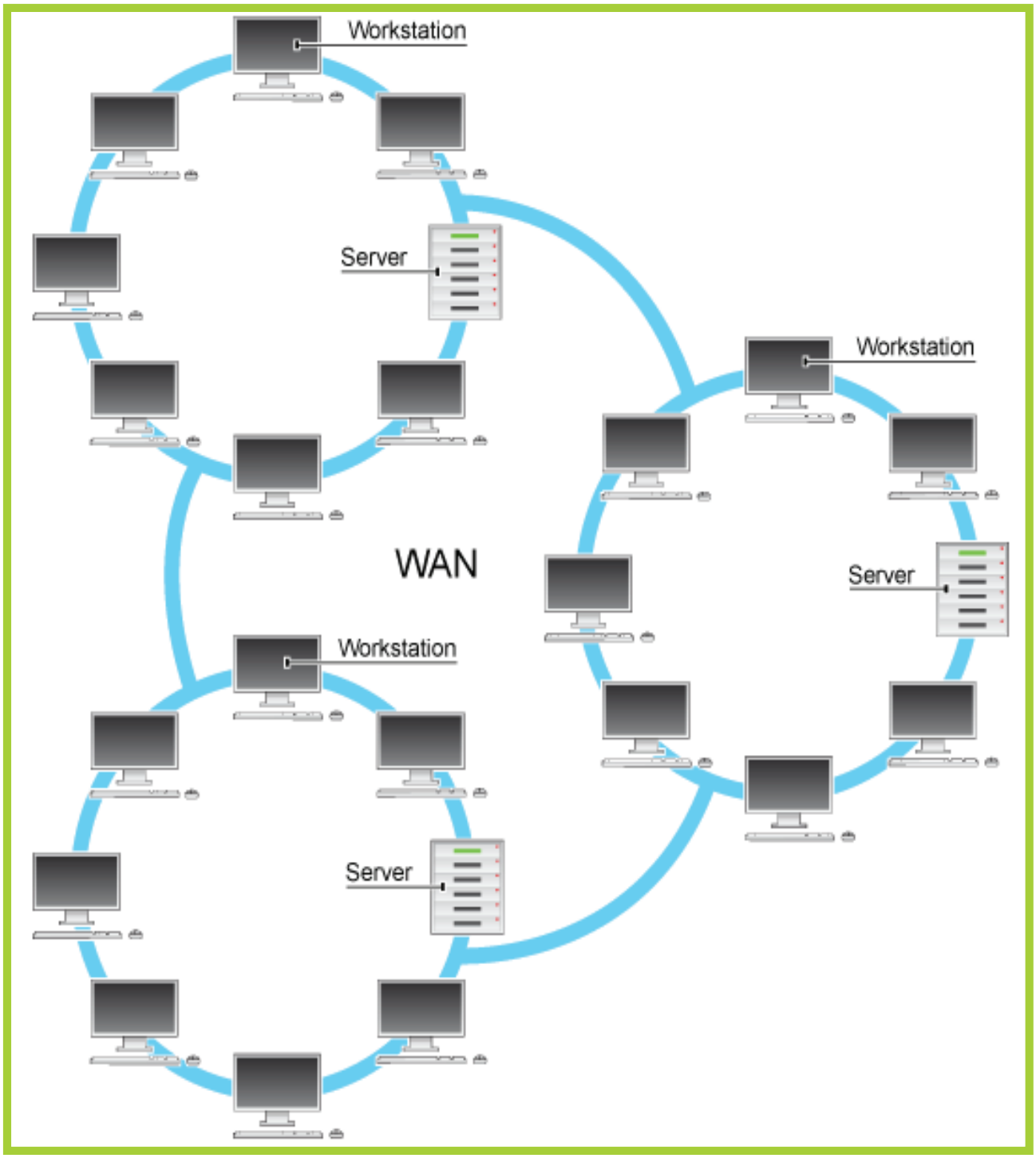


LAN - Local Area Network

(Source: http://www.bbc.co.uk/bitesize/standard/computing/comms_networks/lan/revision/1)

WAN

A **WAN** covers a large geographical area. Most **WAN**s are made from several **LAN**s connected together.



WAN - Wide Area Network

- The Internet is a **WAN**.
- A network of bank cash dispensers is a **WAN**.
- A school network is usually a **LAN**.
- **LAN**s are often connected to **WAN**s, for example a school network could be connected to the Internet.
- **WAN**s can be connected together using the Internet, leased lines or satellite links.

Pre-Reading Activity

Teacher asks the following questions to students (either in pairs or in open class) to assess their knowledge and activate the schemata

1. What is a network?
2. What are its hardware components?
3. What is a LAN and WAN?

Reading Activity

Students read text (1) – (2) and find a word in the text to complete the gaps.

1. A ..... is a main computer that provides a service on the network.
2. A ..... is a number of computers and peripherals linked together.
3. A ..... is a network connecting computer over a small distance.
4. The Internet is an example of a ..... .

(3) What are the differences between WANs and LANs

Local area networks and wide area networks are essentially the same in many aspects. They only differ in the area that is covered by the network. LANs are networks that are limited to a small geographic location. The computers connected to the network could be in a single room, a few rooms, or spread out in an entire building. **WAN**s, on the other hand, cover great distances and are not limited to a single location. The biggest and most popular example of a WAN is the internet, which spans the whole globe and has millions of computers connected to it.

LANs are very common nowadays, it is commonplace in a work environment and even at home. It is necessary to implement a local area network in order to connect multiple computers to the internet using a single **DSL** line. With regards to speed, **LAN** usually operates at much higher rates compared to **WAN**. This is largely due to the proximity of the computers and the lack of congestion in most cases. It is common to experience up to 80 or 90 mbps in a **LAN** while achieving 10 to 20mbps is already a great achievement for **WAN**.

Security wise, **LAN** can be more secure due to the fact that all the computers are within a specific area and are physically easier to secure. The data on a **WAN** needs to pass across public phone lines in order to reach its intended destination. The data is then vulnerable to attack by anyone with the right skills to penetrate your network. Unlike **LAN**, there is just no physical way of securing it, which is why electronic features are the only defence structure in place.

Cost also varies greatly between the two. Deploying a **LAN** is relatively much easier and cheaper than a **WAN**. It wouldn't require more than the cables, some switches, and optionally, routers to those who want to connect to the internet. Whereas with **WAN**, the long distances that the data travels would need miles and miles of cabling, or in some

cases satellites. Signal deterioration is also a very real problem for **WANs**, that's why repeaters are used at intervals to amplify or rebuild the original signal.
(Source: http://www.differencebetween.net/technology/difference-between-lan-and-wan/)
(Source: http://www.digsitevalue.org/k/one-lan)

Reading Activity
Students read text (3) to find out the answers to these questions.
1. Which are faster LANs or WANs?
2. WANs are more secure. True or False?
3. Which network is more expensive to implement?

Teaching Tip: Extension Activity
Additional questions could be provided for students who complete the reading activity more quickly.

Post Reading Language Work: Balancing contrasting facts or ideas

- while
- whereas
- on the other hand

These expressions are used to balance two facts or ideas that contrast but do not contradict each other. See how they are used in the reading (3) above.

Activity: Using contrasting statements *on the other hand, while, whereas link pairs of sentences. See the example below.*

Example: **L**ANs are networks that are limited to a small geographic location. WANs cover great distances and are not limited to a single location.

LANS are networks that are limited to a small geographic location, whereas WANS cover greater distances and are not limited to a single location.

1. LANs usually operate at high rates, up to 60 or 80 mbps. WANs usually achieve 10 to 20mbps.
2. WANS may need miles of cabling. LANs need less cabling.
3. LAN are physically easy as to secure as the computers are within a specific area. The data on a WAN needs to pass across public phone lines and is more vulnerable to attack.

Extension Activity – Additional questions for students who finish more quickly

Can you complete these sentences using ideas from the reading (3) and appropriate **contrasting words?**

1. A LAN network can consist of just several computers ..
2. It is easier to install a LAN....

Writing Activity: Topic sentences Advantages/Disadvantages of networks.

1. Teacher elicits role of topic sentences in a written text.
2. In pairs Students underline topic sentences in text (3) *What are the differences between LANs & WANs?*

Students summarize the differences between a LAN and a WAN using topic sentences and discourse markers practiced earlier *(on the other hand, while, whereas).* This summarizing activity could be set for homework.

Specialist Vocabulary Exercise

Match the acronyms with their meaning

1.	ADSL	A.	Internet service provider
2.	SMS	B.	Graphics Interchange Format
3.	ISP	C.	Local area network
4.	RFID	D.	Joint Photographic Experts Group
5.	WAN	E.	Internet Cache Protocol
6.	GIF	F.	Wide area network
7.	IP	G.	Asymmetric digital subscriber line
8.	LAN	H.	Short Message Service
9.	JPEG	I.	Internet Protocol
10.	ICT	J.	Radio-frequency identification

Reading: Mesh networks: These self-healing nets are fast and reliable.

Russell Kay (10 August 2009)

In most modern networks, links and nodes are interconnected (both logically and physically), but one broken link in the setup can isolate a node, cutting it off from the network.

A newer arrangement, mesh networking, connects each node to at least two other nodes (and potentially to each and every other network node, an arrangement referred to as "fully connected"). This involves more cabling (or more wireless devices) and greater overhead, but it allows the network to heal itself automatically when a break occurs, so there's no interruption of service to any node.

The lack of a hub-and-spoke structure is what distinguishes a mesh network. Also, meshes don't need designated routers; instead, nodes serve as routers for one another. Thus, data is passed from node to node in a process called hopping.

The first and best example of a mesh network is the Internet itself. Information travels across the Net by being forwarded automatically from one router to the next until it reaches its destination.

The Internet is often depicted as a "cloud" because there are billions of potential paths a signal can take, and it's impossible to predict in advance what that route will be.
Wireless networking is an ideal vehicle for setting up a mesh network, because it can be done quickly and on an ad hoc basis. Wireless mesh nodes are small radio transmitters that function much like wireless routers.

(Adapted from: http://www.computerworld.com/s/article/341095/Mesh_Networks)

Wireless network	The interconnection of computers using signals carried through the air (usually radio waves) instead of through connecting cables.
Hub	A common connection point for devices on a network.
Hops	Intermediate devices through which data must pass between source and destination, rather than flowing directly over a single wire.
LAN	Local area network
Node	A network terminal or point where a computer is connected to a network.
Router	An electronic device that links different networks or parts of a network. It determines the path that a signal takes to reach its destination.
WAN	Wide area network
Ethernet	A widely-used local area network standard that broadcasts packets of data that are addressed to particular devices on the network. Each device on the network reads the address and passes it on to the correct device.

Reading Activity
Complete gap fill of definition of a mesh network

node LAN reliable hopping rerouted

A mesh network is a ..... (usually wireless) where each ..... is connected to many others, configured to allow connections to be ..... around broken or blocked paths, with the signal ..... from node to node until it reaches it destination. Mesh networks are self healing and very .....

Answer
A mesh network is a LAN (usually wireless) where each node is connected to many others, configured to allow connections to be rerouted around broken or blocked paths, with the signal hopping from node to node until it reaches its destination. Mesh networks are self-healing and very reliable.
(Source: http://www.computerworld.com/s/article/341095/Mesh_Networks)]

Video Activity: How Mesh Networks work

Mesh networks are not just experimental network architectures — they are actively being used to connect devices in a decentralized way. This video explains how mesh networks work. **(Published on** Dec 4, 2012).
(source: http://www.youtube.com/watch?v=tYLU755T6_I)

Video Activity
Students watch this short video (up to 3mins. 10secs).and make notes on the advantages / disadvantages of Mesh Networks. Weaker students could be given the advantages / disadvantages in the form of a gap fill. As they watch the video they fill in the missing information.

Video Activities – Teaching Tips
This video covers the vocabulary and terminology of Mesh networks. It could be used in several ways.
1. After the reading *Mesh Networks*: *These self-healing nets are fast and reliable,* to reinforce the specialist vocabulary and ideas of the reading.
Or
2. Students could watch the video, without reading the text *Mesh networks: These self-healing nets are fast and reliable.* The vocabulary matching exercise (see pre-reading task above) could be given to the students before they watch the video.

Advantages and disadvantages of Networks

Advantages
• Sharing devices such as printers save money.
• Site (software) licenses are likely to be cheaper than buying several standalone licenses.
• Files can easily be shared between users.
• Network users can communicate by email and instant messenger.
• Security is good – users cannot see other users' files unlike on stand-alone machines.
• Data is easy to backup as all the data is stored on the file server.
Disadvantages
• Purchasing the network cabling and file servers can be expensive.
• Managing a large network is complicated, requires training and a network manager usually need to be employed.
• If the file server breads down the files on the file server become inaccessible. Email might still work if it is on a separate server. The computers can still be used but are isolated.
• Viruses can spread to other computers throughout a computer network.
• There is a danger of hacking, particularly with wide area networks. Security procedures are needed to prevent such abuse, e.g. a firewall.

Pre-reading Activity.
Tasks the following question to students (either in pairs or in open class) to assess their knowledge and activate the schemata.
What advantages do you think networks have over standalone computers?
Reading Activity (1).
The advantages & disadvantages of networks are put on laminated cards. In pairs Students divide the sentences into advantages & disadvantages.

Reading activity (2)
Students read the questions below and circle true or false. For false statement Students give the correct information.

1. If the file server fails than no one can access their work from the network. True/false
2. Setting up a computer network is fairly cheap as you don't need much in the way of hardware. True/false
3. On a network your files and folders are stored on the internet. True/false
4. One problem for a network is the possible spread of viruses. True/false
5. A firewall may prevent hacking. True/false

(Source: http://www.bbc.co.uk/schools/gcsebitesize/ict/datacomm/2networksrev2.shtml)

Group speaking activity:

You are an IT consultant. A local school with 20 stand-alone PCs is considering networking them together and adding a file server and has asked for your advice.
In your groups consider four possible benefits of doing this. You will then orally present your case to your class mates.

Discourse markers for structuring formal speech

To begin with	**Consequently**
Moreover	**Additionally**
In conclusion	

Teaching Tip
Each student in the group presenting their case study takes a card with a discourse marker (see cards above). During their oral presentation the students have to use the discourse markers. The other students listen for the use of the discourse markers.

ICT VIRUSES

A *virus* is a simple *program* designed to cause harm to someone else's computer. A virus spreads by duplicating and attaching itself to other files. The extent of the damage depends on the virus. There are tens of thousands of viruses.
Some virus damage is insignificant but inconvenient. Some virus damage is disastrous, putting the computer system out of action by erasing files or corrupting *data*.

How do you get a virus?

Viruses are written by malicious programmers who wish to cause problems for other computer users.

The primary source of infection these days are *email attachments* followed by **illegal** *software* and infected files from the *Internet*. If you have up to date *anti-virus* software installed this will immediately warn you of any infection. If not, there is usually no evidence of the virus and the user is not usually aware of it until something goes wrong.

How can you reduce the risk of getting a virus?
Viruses can be prevented by taking sensible precautions, including:

- Keeping your *operating system* up to date.
- Using up to date *anti-virus software*.
- Not opening an *email attachment* unless you are expecting it and know the source (many email *servers* scan emails with anti-virus software on the user's behalf).
- Not allowing other users to use their own *memory stick* on your system.
- Only *downloading* files from reputable web sites.
- Avoiding software from unreliable sources.

Anti-virus software can inspect computer files and email attachments for viruses and remove or quarantine any which are found.
It is good practice to *backup* your *data* regularly. If a virus does damage your data, you can *restore* the damaged files from backup.
(Source: http://www.bbc.co.uk/schools/gcsebitesize/ict/implications/virusesrev1.shtml)

Reading Activity

Post reading multiple-choice questions
Teacher asks the following questions to students (either in pairs or in open class) to assess their knowledge and activate the schemata.

1. What is a computer virus?
2. How are viruses spread?
3. Name any viruses you know?
4. How can you deal with viruses?

These could be done either on-line or paper-based

1. What is a computer virus?

- (•) a program written to cause harm to a computer
- ( ) a hardware fault which causes data to be damaged
- ( ) a fault with the CPU which means that data is lost or damaged

2. What is the most common way people's computers get infected by a virus?

- ( ) receive a fax
- ( ) install new hardware
- ( ) download email attachments

3. Which of the following statements is true?

- ( ) you can buy programs that tell you if you have a computer virus
- ( ) computer viruses always destroy your work
- ( ) you must reinstall your operating system to get rid of a virus

4. What type of warning are you most likely to receive if a virus is found on your system?

- ( ) the computer will shut itself down
- ( ) a siren will sound and continue until the virus is removed
- ( ) your anti-virus software will display a message and ask you how to proceed

5. What purpose does anti-virus software serve?

- ( ) it deletes every file it suspects is infected
- ( ) it stops people gaining unauthorized access to your computer via the internet
- ( ) it inspects computer files and email attachments for viruses and removes or quarantines any that it finds

6. Which of the following is BAD advice for protecting your computer against infection?

- ( ) open email attachments if they look interesting
- ( ) use up-to-date anti-virus software and always download the latest definitions
- ( ) only download files from reputable internet sites

(source: http://www.bbc.co.uk/apps/ifl/schools/gcsebitesize/ict/quizengine?quiz=viruses;templateStyle=ict)

Language Activity: If clauses

Study these uses of *if*-sentences

Action and effect
We can use an if-sentence to link an action and its effect. For example:

1. If you have an up to date anti-virus software installed, this will immediately warn you of any infection.
2. If you want to identify computer viruses, you can buy programs that detect them.
3. If you have an anti-virus software, it inspects computer files and e-mail attachments for viruses.

- Students underline the verb tenses used in each clause.

The action is in the Present simple and the effect is in the Present simple or described using will, can, or may depending on how certain it is to follow.

- Students use examples from the multiple-choice reading to write some action and effect sentences.

1. Students needing more support in writing can be given a prepared list of actions/ effects. They join action and effect using an *if-sentence.*

Examples:

Column A	***Column B***
1. download an email attachment	*a. your anti-virus software will display a message*
2. a virus is found on your system	*b. your computer may get infected by a virus*

2. Students needing some support in writing can be gives a list of action and they have to describe the effects using *if-sentences.*

Examples:

1. *your computer may get infected by a virus*
2. *your anti-virus software will display a message*

Additional Resources
If students want to broaden their knowledge of the different type of viruses: virus, worm and bots – there is a short cartoon video (approx 4 min) at: http://www.youtube.com/watch?v=c34QwtYI40g
Suggested Listening Activity.
Students could be asked to write notes on the differences between viruses, worms and bots or weaker students could be given a gap fill activity to complete.

Group writing activity: Poster
Students in small groups prepare a poster advising students about the problems of computer viruses and offering advice on what they can do to limited the damaged caused by viruses.
Each group works for a different anti-virus software company and so have to persuade other groups of students why theirs is the best product to buy.
Students use vocabulary and grammar structures practised in the lesson. Teacher provides input on *Persuasive Words Used in Advertising*, for example special offer, remarkable, revolutionary, bargain etc.
Posters are displayed and students vote for the most informative/persuasive poster.

DEFINING THE PEER-TO-PEER MODEL

Viruses turn to peer-to-peer nets (BBC News, Technology January 20th 2004)

Virus writers are setting up peer-to-peer networks to help their malicious creations spread.
The networks are being used to control thousands of innocent PCs that some virus programs have infected.
The tactic is being used because peer-to-peer networks are hard to disrupt, making viruses using this technique hard to stop spreading.
Security experts say peer-to-peer networks are likely to become more and more popular with virus writers.

Many computers are under the remote control of virus writers

Evolving threat

One of the first viruses to set up a peer-to-peer network to help it spread was the Slapper worm that was aimed at the Linux operating system.
A Windows virus called Sinit appeared in late 2003 that turned every machine infected by the malicious program into a member of a peer-to-peer network.
It was expected that Sinit's creator would issue commands to infected computers via this network.
"It's always been an arms race in the battle between virus writers and anti-virus companies," said Pete Simpson of mail filtering firm Clearswift.
"Sinit represents a new and daunting challenge to anti-virus companies."

> *"It's always been an arms race in the battle between virus writers and anti-virus companies*
> *Pete Simpson, Clearswift"*

There are many different ways to organize machines into peer-to-peer networks but most avoid having one central computer, or server, controlling all machines involved. Instead, each machine shares the burden of organizing the system and each member lets others know the information that it holds. The most well-known peer-to-peer networks, such as Kazaa, are used by many people to find and share music, videos and other types of files.

Boot nets

In the past some creators of Trojan programs, that open up a backdoor into an infected PC, have used net chat channels as a way to issue commands.
Often thousands of computers were enrolled in these remote controlled networks that have been dubbed "'boot nets". Finding and shutting down the chat channels would effectively cut a virus writer off from his network of slave machines.
But shutting down a distributed network would be much more difficult because no one machine is in charge. It also is much more difficult to trace where commands were being inserted and find the network's controller.
Kevin Hogan, head of Symantec Security Response, said the good news about peer-to-peer virus networks was that they were rare.
"It's a little bit trickier to do than just having the Trojan point to a single server," he said. He said many peer-to-peer networks were often not very efficient at passing commands between member machines. Also many swap data via rarely used ports that most firewalls routinely block.

Many people use peer-to-peer networks to swap music and movies

(Source: news.bbc.co.uk/2/hi/technology/3409187.stm)

Gap fill Activity - Defining the Peer-to-Peer Model

model	shared	difference	store	server
operating	database	passwords	networks	

Peer-to-peer (P2P) networking first and foremost means that each computer is treated as an equal. This means each computer has an equal ability to serve data and to access data, just like any other computer on the network. Before servers became popular in PC-based computer networks, each PC had the ability to ..... data. Even after the client-server model became king, peer-to-peer ..... still had their place, especially in smaller networks with 10 computers or less. Today, peer computers can serve data; the only ..... is that they can only serve it to a small number of computers at the same time.

In organizations that use these small networks, the cost, administration, and maintenance of a server is too much for the organization to consider viable. Thus, a Microsoft peer-to-peer network might consist only of a couple Windows XP computers, a few Windows Vista computers, and some newer Windows 7 and older Windows 2000 computers. These are client operating systems, and as such are known as peers because there is no controlling ..... in the network. This usually works well enough for smaller organizations. The beauty of Microsoft client ..... systems is that up to 10 computers (20 in Windows 7 Ultimate) can concurrently access an individual peer's ..... resource. So, in these environments, one lucky peer usually acts as a sort of pseudo-server, so to speak. Still, additional resources like files, databases, printers, and so on can be added to any other computer on the network. The main disadvantage of this network ..... is that there is no centralized user database. Usernames and ..... are individually stored per computer. To implement a centralized user ....., you need to have a Windows Server, which means that a client-server model would be employed.

Homework
Writing

Networks connect computers together so they can share resources and data.
Summarize the differences between a LAN and a WAN by using topic sentences and discourse
markers practiced earlier (on the other hand, while whereas).

LESSON PLAN WEEK 3/4 TOPIC: COMPUTER NETWORKS

Topic: Client Server Network (CSN) & Function of the Server

Learning objectives: By the end of the lesson students will be better able to:

1. Read a text for specific information
2. Understand and demonstrate knowledge of the function of network servers
3. Describe the characteristics of these networks with greater fluency.
4. Ask for and give information about print servers and the messaging servers
5. Give examples of the servers in the network
6. Summarize the advantages and disadvantages of client server and peer-to-peer server in writing.
7. Use gerunds and infinitives (e.g. infinitive of purpose/before/after/while +ing).

Activity	Differentiation	Interaction	How learning will be checked /assessed
1. Introduce learning objectives – explain learning outcomes.	Least independent	T	
2. Reading Defining the Client Server *Model*		T-S	Monitoring
• divide the class in two groups to analyze the Print and Messaging Servers.		S-S	Qs & As
• In pairs students exchange information	Independent		Multiple-choice
• Students complete comprehension questions.		T-S	
• Students complete multiple-choice questions.	More independent	S-S	Gap fill
3. Language work (prepositions + gerund)	Less Independent	S-S	
• Students find examples in reading *Defining the Client Server Model*		S-S	
• Complete gap fill exercise		S-S	Monitoring
4. Jigsaw Reading	Independent	S-S	
• Class divided into two groups.			Written paragraph
• Each group given text either about client server model or peer-to-peer model.			Completed sentences
• Students read text and summarize the main points.			
• Students exchange information about different servers.			
5. Writing a summary			
• Students summarize the information shared with each other.			
• Students write a paragraph on their findings (advantages and disadvantages) of client and peer to peer server.			
• Students find ten words learnt in this topic and make sentences with them.			
6. Homework			
HOMEWORK:	Describe the function of an email server and show how it differs from a web server.		

DEFINING THE CLIENT-SERVER MODEL

Client / Server type is more complex than p2p network type. In this type of network computer controls all the functions of rest of the computers. This computer is known as Server or dedicated server in some cases. All computers (clients) are connected to server using hub or switches with help of LAN cards and cable. Clients access dedicated server at the same time for retrieving files, documents, database, images, spreadsheets and hardware like printers, scanners etc. In client server methodology server is the only controller which centralized everything on the network, if server fails entire network will fail and only clients' local drive will be accessible using administrator user/pass for that computer.

First and most important step is to configure Server, for that we will choose OS for server. We can install windows 2000 or windows 2003 server. After installing OS first step would be to create domain. We can make domain with the help of RUN "DCPROMO.exe" command. Once you run this command you will be asked for unique domain name. This domain name will be used in all client computers to include them client of the server. Before running this command make sure that you have all the hardware plugged in properly because after completing domain name, this command will install active directory onto the server and step by step wizard will guide you through the rest of the process. Server should be restart when Active directory is installed, thereafter network users can be defined on the server.

After server installation and configuration, clients are required to be configured. Installed Windows XP professional addition on each client and perform the following steps to make them part of network.

Here are some examples of uses for servers:

Print server: A print server controls printers that can be connected directly to the server or (and more commonly) are connected to the network. The print server can control the starting and stopping of document printing, as well as concepts such as spooling, printer pooling, ports, and much more. By default, Windows Server 2008, Windows Server 2003, and Windows Server 2000 can be print servers right out of the box.

Database server*:* A database server houses a relational database made up of one or more files. SQL databases fall into this category. They require special software, such as Microsoft SQL Server. Access databases (which are just one file) do not necessarily require a database server; they are usually stored on a regular file server.

Network controller: A controlling server, such as a Microsoft domain controller, is in charge of user accounts, computer accounts, network time, and the general well-being of an entire domain of computers and users. Windows Server 2008, Windows Server 2003, and Windows Server 2000 can be domain controllers, but they need to be promoted to that status. By default, a Windows Server operating system is not a controller. Network controller operating systems are also referred to as network operating systems or NOS.

Messaging server: This category is enormous. Messaging servers include not just email servers, but also fax, instant messaging, collaborative, and other types of messaging servers. For a Windows Server to control email, special software known as Exchange Server has to

(Source: http://www.wifinotes.com/computer-networks/how/to-configure-network.html)

Reading Activity - Exercise 1

1. What is the use of a client –server network?
2. When can a RUN"DCPROMO exe be used?
3. What are you going to do before running the RUN "DSPROMO command?
4. What are some of the uses of servers?
5. What is a print server & a database server?
6. What is a network controller & a messaging server?

Reading Activity - Exercise 2

Circle the correct response.

a) A..... is a computer that provides services to clients and controls access to hardware ,software and other resources.

1) Server
2) Switch
3) Repeater
4) Router
5) None

b) A ..... Is a computer that requests service from a server computer.

1) Bridge
2) Client
3) Gateway
4) Cables
5) None

c) Windows Server 2008, Windows Server 2003, and Windows Server 2000 can be ..... right out of the box.

1. print servers
2. router
3. bridge
4. all
5. none

d) When a user first comes into work, he or she typically logs on to a network. Chances are this is a .....

1. Server
2. browser
3. client application
4. client-server network.

e) Web servers are important to share data and provide information about a..... company.

1. to share data
2. to control phones
3. to show the most compatible client
4. to download files

Complete the sentences using the words in the box below.

1. All .....are connected to server using hub or switches with help of LAN cards and cable.
2. In client server methodology server is the only controller which centralized everything on the .....
3. The first and most important step is ..... , for that we will choose OS for server.
4. The print server ..... the starting and stopping of document printing, as well as concepts such as spooling, printer pooling, ports.
5. ..... servers include not just email servers, but also fax, instant messaging, collaborative, and other types of messaging servers.
6. On a client /server network, one computer ..... server that provides services and the other computers (client) on the network request services from the server.
7. Client /server is easy ..... .
8. Client /server is used in ..... networks.

computers (clients) network small and large Messaging

to manage to configure Server act as a can control

Language Activity: Gerunds

The –ing form of a verb is used after prepositions. This includes to when it is a preposition and not part of the infinitive.
Look at these examples from the reading Defining the Client-Server Model

After installing OS.
Before running this command

- Students underline other examples of gerunds in the reading text.

Reading Activity – Exercise 3

Language Practice

Complete each gap in these sentences with *the correct form* of an appropriate verb from this list: infinitive or *–ing* form.

use	have	install x 2	find
hack	know	share	link

1. Search engines are ways of _____information on the web.
2. Fibre-optic cable can be used for _____ computers in a network.
3. In wireless networks, instead of _____ cables, devices are linked by radio waves.
4. We look forward to _____ faster and cheaper computers.
5. Many organizations are now choosing to _____ wireless networks.
6. People sometimes try to _____ into a computer system without _____ the password.
7. Networks save money by _____ peripherals such as printers.
8. In some old buildings it can be expensive to _____ cables and access points.

Answers

1. Search engines are ways of finding information on the web.
2. Fibber-optic cable can be used for linking computers in a network.
3. In wireless networks, instead of installing cables, devices are linked by radio waves.
4. We look forward to having faster and cheaper computers.
5. Many organizations are now choosing to install wireless networks.
6. People sometimes try to hack into a computer system without using the password.
7. Networks save money by sharing peripherals such as printers.
8. In some old buildings it can be expensive to install cables and access points.

Writing Activity

After exchanging information about client and peer-to-peer servers, students write a paragraph of their findings (advantages and disadvantages of the two different types of servers)

Homework

Writing

Describe the function of an email server and show how it differs from a web server.

LESSON PLAN WEEK 5/6 TOPIC: TOPOLOGIES OF COMPUTER NETWORKS

Learning objectives: By the end of the lesson students will be better able to:

1. **Define the term topology and extend their vocabulary for different kinds of topology**
2. **Explain the functions of topologies with the aid of visual representation**
3. **Use appropriately verb and preposition combinations**
4. **Develop fluency and cohesion in long turn discussions talking about the impact of inventions in people's life**
5. **Produce information leaflets on different kinds of topologies**
6. **Identify specific information in a reading passage**
7. **Use sequencers to order the steps of a process**
8. **Analyze and describe data from diagrams**
9. **Produce a coherent paragraph comparing particular topologies**

Activity	Differentiation	Interaction	How learning will be checked /assessed
1. Introduce learning objectives – explain learning outcomes.	Less independent	T –S	
2. Reading: The beginnings of Topology • Pre-reading: Brainstorm what students know about Topology. • Teacher elicits the connection of the picture of the bridge and topology • Students read the material silently and underline the names of people. • Post-reading activity: Students match the information with the corresponding contributors.	More independent Independent S-S		Task approach : Underlining Elicitation technique/ Silent reading Matching exercises. Task approach tops for teachers / students (test preparation)
3. Language work (Verb + Preposition) • Students identify the verb and preposition combination in the text • Pair work – gap filling exercise	Independent T-Ss	Ss-Ss	Monitoring
4. Speaking – presentation • Sts work in groups to prepare presentation for long turn discussions about the history of topology	Independent T-Ss	Ss-Ss	Assigned roles in group work / integrated skills
5. Reading: *Bus Topology* • Lead-in: Sts are asked to identify the key words in the definition of the term topology • Activity: Check the understanding of the components of bus network – label the diagram with the underlined words	Less independent		

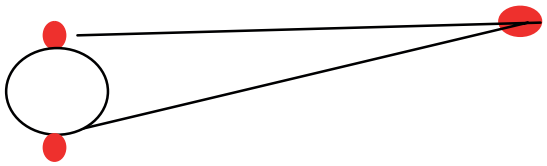
Activity	Differentiation	Interaction	How learning will be checked /assessed
6. Language function –explain how something works • Sts watch a video on and identify the steps while listening to a specialist speaking about how bus topology functions • While listening students (1) Identify linking words (such as: when, whenever, so that) and (2) Identify the key words used for explaining the process. **7. Identifying stages in a process – jigsaw reading** • Students in pairs/small groups order reading cut into slips. • Suggested example on the theme *How to set up your home network.* • *Students order slips and watch video to check answers.* (http://www.youtube.com/watch?v=X221CtO5NQA) **8. Integrated skills** • Lead-in to star topology: Students look at the diagram and identify the differences in arrangement as compared to bus topology. • Based on the information from the text on *star topology* and the advantages and disadvantages of *bus topology*, students are asked to work out the advantages and disadvantages of star topology in two groups. **9. Writing activity** • Students contrast the pros and cons of bus and star topologies. They should practise using topic sentences and linkers to express contrast.	Independent Independent Independent	Ss-Ss T-Ss Ss-Ss	Monitoring Qs & As Jigsaw reading Note taking in video listening/ analyzing information from diagrams
HOMEWORK:	Research and write about inventors and their contribution to society.		

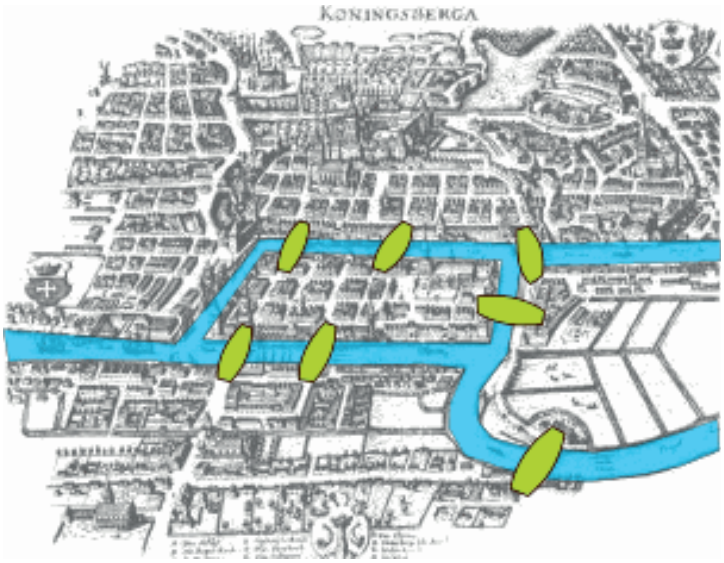
HISTORY OF NETWORK TOPOLOGIES

Reading Activity

The beginnings of Topology

The term "Topology" was introduced in German in 1847 by Johann Benedict Listing in *Vorstudien,* who had used the word for ten years in correspondence before its first appearance in print. "Topology," its English form, was first used in 1883 in Listing's obituary in the journal *Nature* to distinguish "qualitative geometry from the ordinary geometry in which quantitative relations chiefly are treated". The term **topologist** in the sense of a specialist in topology was used in 1905 in the magazine *Spectator*. However, none of these uses corresponds exactly to the modern definition of topology.
Modern topology depends strongly on the ideas of set theory, developed by Georg Cantor in the later part of the 19th century. Cantor, in addition to establishing the basic ideas of set theory, considered point sets in Euclidean space as part of his study of Fourier series.
Topology is one of the newest branches of mathematics. One of the first papers in topology was the demonstration, by Leonhard Euler, that it was impossible to find a route through the town of Königsberg (now Kaliningrad) that would cross each of its seven bridges exactly once. This result did not depend on the lengths of the bridges, nor on their distance from one another, but only on connectivity properties: which bridges are connected to which islands or riverbanks. This problem, the *Seven Bridges of Königsberg*, is now a famous problem in introductory mathematics, and led to the branch of mathematics known as graph theory.





Problem 1.

Sketch the below, map of the city on a sheet of paper and try to 'plan a journey' with a pencil in such a way that you trace over each bridge exactly once and only once and you complete the 'plan' with one continuous pencil stroke
Euler realised that all problems of this form could be represented by replacing areas of land by points (he called them vertices), and the bridges to and from them by arcs. For Konigsberg, let us represent land with red dots and bridges with black curves.
Thus in its stripped down version, the seven bridges problem looks like this:

The problem now becomes one of drawing this picture without retracing any line and without picking your pencil up off the paper.
All four of the vertices in the picture above have an odd number of arcs connected to them. You could start at that vertex, and then arrive and leave later. But then you can't come back. Thus every vertex with an ODD number of arcs attached to it has to be either at the beginning or the end of your pencil-path. So you can only have up to two 'odd vertices'! Thus it is impossible to draw the above picture in one pencil stroke without retracing.
Thus we are unable to solve The Bridges of Konigsberg problem. Take one of these vertices, say one of the ones with three arcs connected to it. Say you're going along, trying to trace out the above figure out without picking up your pencil. The first time you get to this vertex, you can leave by another arc. But the next time you arrive you can't. So you'd better be through drawing the picture when you get there!
One of the first papers in topology was the demonstration, by Leonhard Euler, that it was impossible to find a route through the town of Königsberg (now Kaliningrad) that would cross each of its seven bridges exactly once. This result did not depend on the lengths of the bridges, nor on their distance from one another, but only on connectivity properties: which bridges are connected to which islands or riverbanks. This problem, the Seven Bridges of Königsberg, is now a famous problem in introductory mathematics, and led to the branch of mathematics known as graph theory.

(Source: http://www.historymcs.st-and.ac.uk/_/topology_in_mathematics.html)

Solutions

Figure 1.

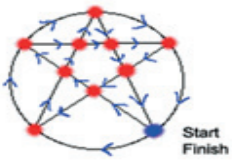


Figure 2.

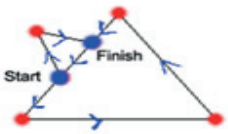


Figure 3.

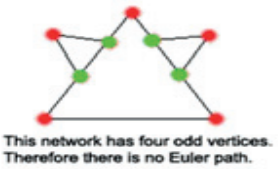


Figure 4.

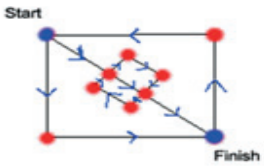


Figure 5.

15

What is a Topology?

The physical topology of a network refers to the configuration of cables, computers, and other peripherals. Physical topology should not be confused with logical topology which is the method used to pass information between workstations

Considerations When Choosing a Topology

- **Money**. A linear bus network may be the least expensive way to install a network; you do not have to purchase concentrators.

- **Length of cable needed**. The linear bus network uses shorter lengths of cable.
- **Future growth**. With a star topology, expanding a network is easily done by adding another concentrator.
- C**able type**. The most common cable in schools is unshielded twisted pair, which is most often used with star topologies.

Reading Activity

Match people with activities.

1. Used the word for ten years in correspondence before its first appearance in print.
2. Established the basic ideas of set theory.
3. Demonstrated in a paper that it was impossible to find a route through a town that would cross each of its seven bridges exactly once.
4. His study led to a new branch of mathematics known as Graph theory.

A. Johann Benedict Listing

B. Georg Cantor

C. Leonhard Euler

Language Activity

Fill in the gaps with the given verb + preposition combinations

Introduced by connected to leads to depend on

The term "Topologie" was _____Johann Benedict Listing in *Vorstudien.*

Bridges are _____islands or riverbanks.

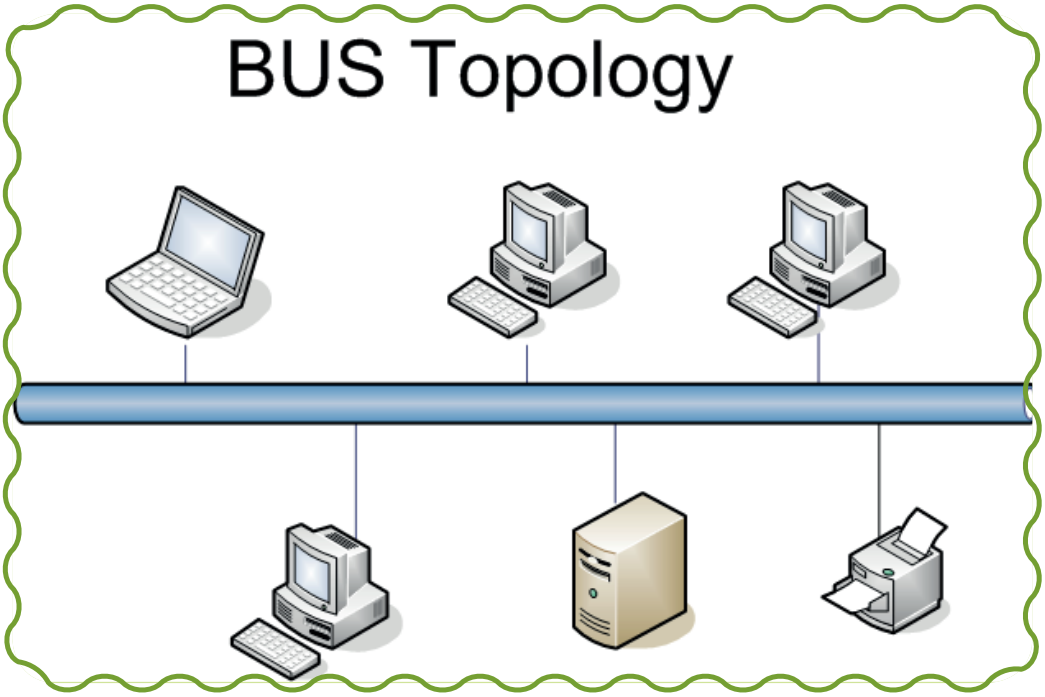
That _____ the branch of mathematics is known as graph theory.
This result did not _____the lengths of the bridges.

BUS TOPOLOGY

A bus network uses a multi-drop transmission medium, all node on the network share a common bus and thus share communication. This allows only one device to transmit at a time. A distributed access protocol determines which station is to transmit. Data frames contain source and destination addresses, where each station monitors the bus and copies frames addressed to itself.

A bus topology connects each computer (nodes) to a single segment trunk (a communication line, typically coax cable, that is referred to as the 'bus'. The signal travels from one end of the bus to the other. A terminator is required at each to absorb the signal so as it does not reflect back across the bus. A media access method called CSMA/MA is used to handle the collision that occur when two signals placed on the wire at the same time. The bus topology is passive. In other words, the computers on the bus simply 'listen' for a signal; they are not responsible for moving the signal along.

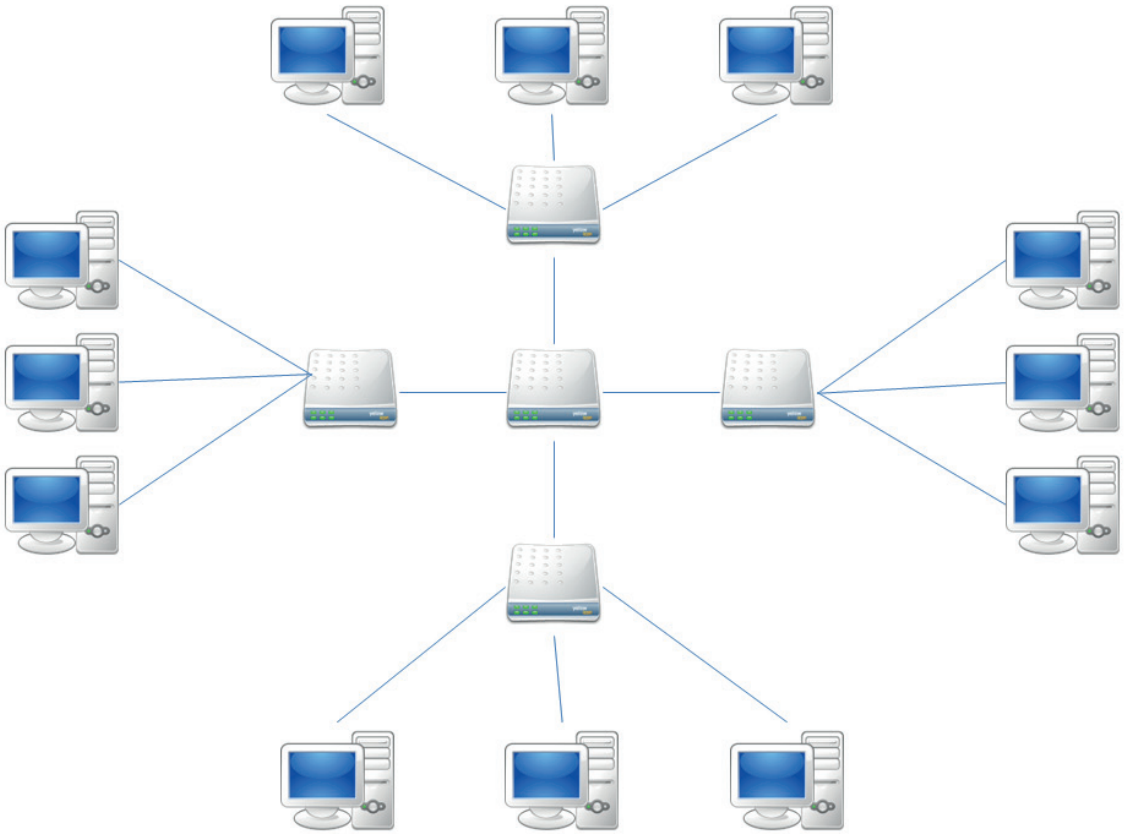
Advantages:
Failure of one of the station does not affect others.
Good compromise over the other two topologies as it allows relatively high rate of data transition.
Well suited for temporary networks that must be set up in a hurry.
Easy to implement and extend.



Disadvantage:
Require a network to detect when two nodes are transmitting at the same time.
Does not cope well with heavy traffic rates
Difficult to administer/troubleshoot.
Limited cable length and number of stations.
A cable brake can disable the entire network; no redundancy.
Maintenance cost may be higher in the long run.
Performance degrade as additional computers are added.

(Source: http://www.homepages.uel.ac.uk/uo116771/bus_topology.htm)

STAR TOPOLOGY: ADVANTAGES AND DISADVANTAGES



What is Star topology?

In Star topology, all the components of network are connected to the central device called "hub" which may be a hub, a router or a switch. Unlike *Bus topology* (discussed earlier), where nodes were connected to central cable, here all the workstations are connected to central device with a point-to-point connection. So it can be said that every computer is indirectly connected to every other node by the help of "hub". All the data on the star topology passes through the central device before reaching the intended destination. Hub acts as a junction to connect different nodes present in Star Network, and at the same time it manages and controls whole of the network. Depending on which central device is used, "hub" can act as repeater or signal booster. Central device can also communicate with other hubs of different network. Unshielded Twisted Pair (UTP) Ethernet cable is used to connect workstations to central node.

Advantages of Star Topology

1) As compared to Bus topology it gives far much better performance, signals don't necessarily get transmitted to all the workstations. A sent signal reaches the intended destination after passing through no more than 3-4 devices and 2-3 links. Performance of the network is dependent on the capacity of central hub.
2) Easy to connect new nodes or devices. In star topology new nodes can be added easily without affecting rest of the network. Similarly components can also be removed easily.
3) Centralized management. It helps in monitoring the network.
4) Failure of one node or link doesn't affect the rest of network. At the same time its easy to detect the failure and troubleshoot it.

Disadvantages of Star Topology

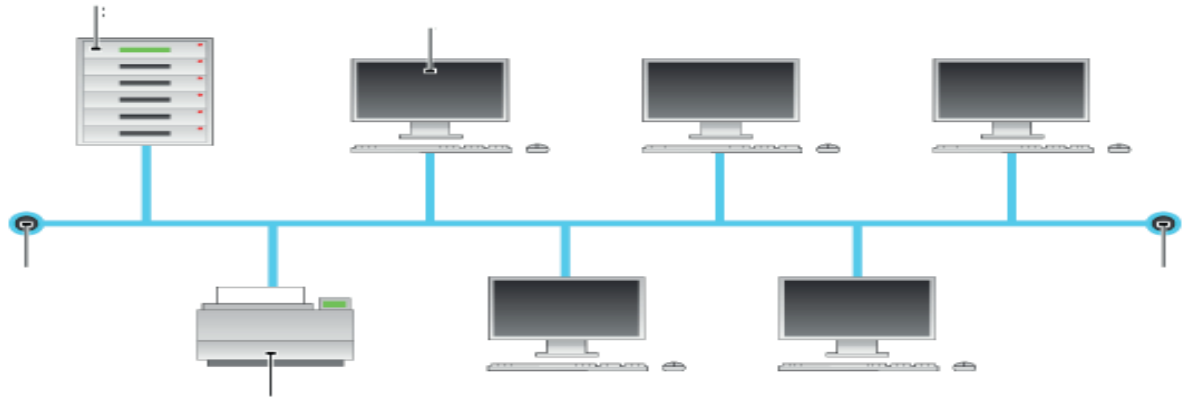
1) Too much dependency on central device has its own drawbacks. If it fails whole network goes down.

2) The use of hub, a router or a switch as central device increases the overall cost of the network.

3) Performance and as well number of nodes which can be added in such topology is depended on capacity of central device.

Reading exercise

Label the diagram after reading the description.
In a bus network all the workstations, servers and printers are joined to one cable (the bus). At each end of the cable a terminator is fitted to stop signals reflecting back down the bus.



A bus network, connecting several workstations, servers and printers.

Language Function: Conjunctions
Conjunctions introduce clauses such as time, reason, result, purpose, condition and contrast

Time	Reason	Result	Purpose	Condition	Contrast
when(ever) while as (soon as) until after since	because as since so	so ... that such ... that	so that in case	if unless as long as	but although even though

Describing a Bus Topology

Watch the Computer Networking Tutorial on Bus Topology.
http://www.youtube.be/oYOeNcJJYos
As you listen:

1. identify the conjunctions used.
2. Identify the key words used for explaining the process.

Activity – Identifying stages in a Process

Students can play the Process Jigsaw game. One suggestion for how the game can be adapted is given below – see *How To Set Up Your Home Network.*

Integrated Skills

Based on the reading you have done so far, and the information you gained from the video on a bus topology, complete the table below. You need to write about the advantages and disadvantages of a star topology.

Star topology

Advantages	Disadvantages

Writing Activity

Write paragraphs to compare and contrast the pros and cons of bus and star topology. Remember to use topic sentences and connecting words to express contrast.

Homework

Research and write about great inventors and their contributions to society.

LESSON PLAN WEEK 7/8 TOPIC: TOPOLOGIES OF COMPUTER NETWORKS

Learning objectives: By the end of the lesson students will be better able to:

1. **Extend their vocabulary for ring, tree and mixed topologies**
2. **Form nouns using a range of common suffixes**
3. **Present and justify an opinion, disagree and discuss implications**
4. **Use second conditionals to provide solutions to hypothetical situations**
5. **Make recommendations for the appropriate use of hybrid topology**
6. **Provide an explanation using a diagram and check understanding from the speaker`s point of view**
7. **Use indirect questions with greater oral accuracy**
8. **Express ability with the accurate use of 'can' and 'be able to'**
9. **Structure a comparative essay demonstrating understanding of the role of paragraphs (e.g. thesis statement/ concluding paragraphs etc.)**

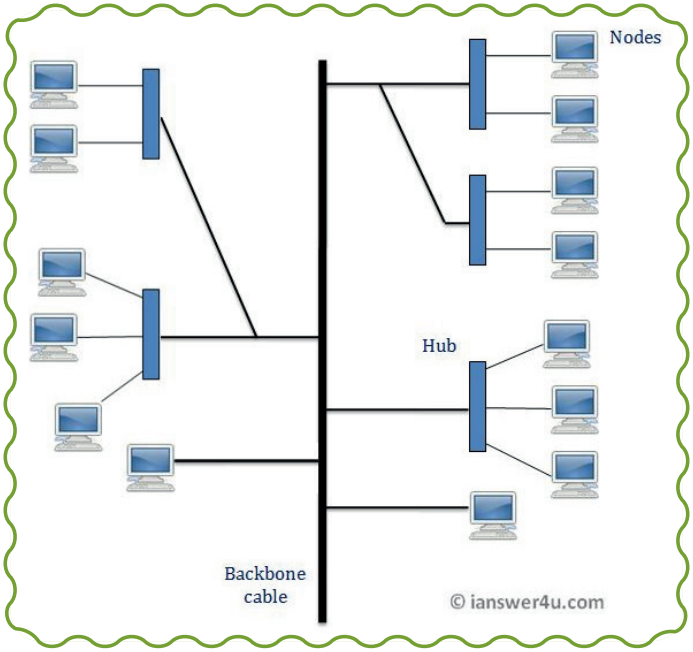
Activity	Differentiation	Interaction	How learning will be checked/assessed
1. Introduce learning objectives – explain learning outcomes.		T-Ss	Integrated skills
2. Reading Ring & Tree Topologies			
• Lead-in: Students comment on the arrangement of Ring and Tree topologies and make predictions on the way they function.	Less independent		
• Post- reading activity: Teacher checks comprehension of the texts about Ring and Tree topologies by giving students a multiple choice exercise.		Ss-Ss	Multiple –choice questions
3. Vocabulary: Word families			
• Teacher asks students to underline the nouns and verbs used in the texts.		Ss-Ss	
• Students complete the table with the correct parts of speech.			Qs & As
• Suffix game. Students in groups pick up card and give the required form of the word.	More independent		Monitoring
4. Speaking skills: case study			
• Teacher asks students to analyze a problem presented in the text on tree topology		Ss-Ss	
• Teacher divides students in groups and asks them to provide a solution to a hypothetical situation using the second conditional.		Ss-Ss	Tips for Presenting and justifying an opinion, disagreeing and discussing implications
5. Reading: Hybrid Network Topology			
• Students read the text and answer the questions.			Qs & As
6. Speaking: Compare/contrast hybrid topologies			
• Teacher divides the class into small groups, comparing and contrasting the hybrid topologies,	Independent		Monitoring
7. Speaking/ Writing: Topologies			
• Teacher divides the class in two groups, describing the advantages and disadvantages of topologies.			Written work
• Students structure comparative essay using thesis statement and concluding paragraph		Groups	
8. Speaking: Problem solving – choosing the right job candidate	Less Independent		
• Students read the job ad and about the 3 applicants. They decide who is the best applicant.			Monitoring
• The resources could also be used as the basis of a role play. Students should be encouraged to use indirect questions.			
HOMEWORK:	Use a given scheme to name the elements that form the mix topology		

TREE TOPOLOGY: ADVANTAGES AND DISADVANTAGES

Reading Activity

What is Tree Topology?

Tree Topology integrates the characteristics of Star and Bus Topology. Earlier we saw how in Physical Star network Topology, computers (nodes) are connected by each other through central hub. And we also saw in Bus Topology, work station devices are connected by the common cable called Bus. After understanding these two network configurations, we can understand tree topology better. In Tree Topology, the number of Star networks are connected using Bus. This main cable seems like a main stem of a tree, and other star networks as the branches. It is also called **Expanded Star Topology**. Ethernet protocol is commonly used in this type of topology. The diagram below will make it clear. Let's discuss the advantages and disadvantages of Tree Topology now.



Advantages of Tree Topology

1. It is an extension of Star and bus Topologies, so in networks where these topologies can't be implemented individually for reasons related to scalability, tree topology is the best alternative.
2. Expansion of Network is possible and easy.
3. Here, we divide the whole network into segments (star networks), which can be easily managed and maintained.
4. Error detection and correction is easy.
5. Each segment is provided with dedicated point-to-point wiring to the central hub.
6. If one segment is damaged, other segments are not affected.

Disadvantages of Tree Topology

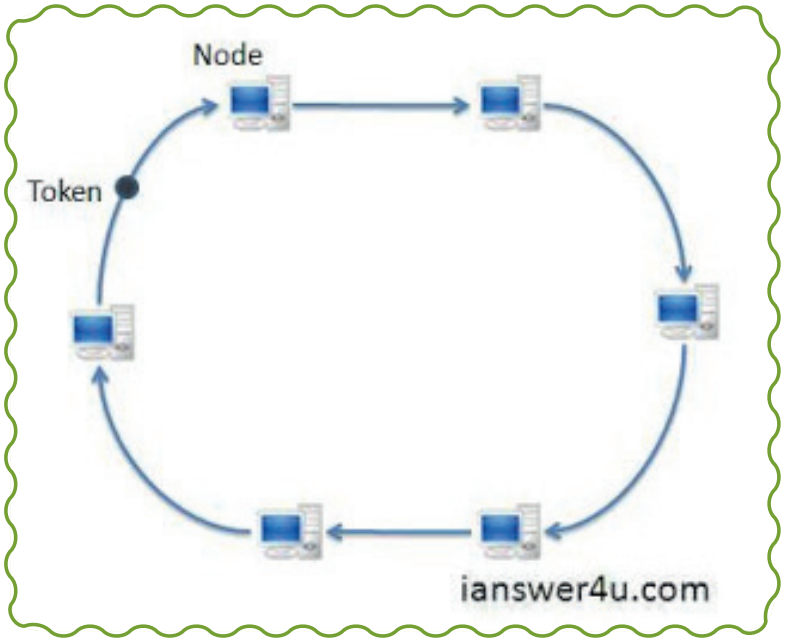
1. Because of its basic structure, tree topology, relies heavily on the main bus cable, if it breaks whole network is crippled.
2. As more and more nodes and segments are added, the maintenance becomes difficult.
3. Scalability of the network depends on the type of cable used.

(Source: http://www.ianswer4u.com/2012/01/tree-topology-advantages-and.html#axzz2.QSmLpW43)

RING TOPOLOGY : ADVANTAGES AND DISADVANTAGES

What is Ring Topology?

In Ring Topology, all the nodes are connected to each-other in such a way that they make a closed loop. Each workstation is connected to two other components on either side, and it communicates with these two adjacent neighbours. Data travels around the network, in one direction. Sending and receiving of data takes place by the help of TOKEN. ***Token Passing*** (in brief) : Token contains a piece of information which along with data is sent by the source computer. This token then passes to next node, which checks if the signal is intended to it. If yes, it receives it and passes the empty to into the network, otherwise passes token along with the data to next node. This process continues until the signal reaches its intended destination. The nodes with token are the ones only allowed to send data. Other nodes have to wait for an empty token to reach them. This network is usually found in offices, schools and small buildings



Advantages of Ring Topology

1 This type of network topology is very organized. Each node gets to send the data when it receives an empty token. This helps to reduces chances of collision. Also in ring topology all the traffic flows in only one direction at very high speed.
2 Even when the load on the network i ncreases, its performance is better than that of Bus topology.
3 There is no need for network server to control the connectivity between workstations.
4 Additional components do not affect the performance of network.
5 Each computer has equal access to resources.

Disadvantages of Ring Topology

1 Each packet of data must pass through all the computers between source and destination. This makes it slower than Star topology.
2 If one workstation or port goes down, the entire network gets affected.
3 Network is highly dependent on the wire which connects different components.
4 MAU's and network cards are expensive as compared to Ethernet cards and hubs.

(Source: http://www.ianswer4u.com/2012/01/tree-topology-advantages-and.html#axzz2.QSmLpW43)

Reading Activity

Circle the right answer:

1. Network topology means:
A. a network diagram
B. the order of machines in a network
C. The layout of the network
D. The number of machines on the network

2. A network arrangement where each computer is linked to a central server on a dedicated line is called:
A. Star network
B. Bus network
C. Ring network

3. A network arrangement whereby each computer is linked to a common shared cable is called:
A. Bus network
B. Ring network
C. Star network

4. A network arrangement where one computer is linked to the next and the last computer is linked back to the first is called:
A. Ring network
B Star network
C. Bus network

5. Which network topology has terminators to prevent signals from bouncing back and forth?
A. Star network
B. Ring network
C. Bus network

6. Which is the best choice of network topology for temporary networks?
A. Star network
B. Bus network
C. Ring network
D. Any network

7. Which network will stop working if there is a problem with the central cable?
A. Bus network
B. All networks
C. Star network
D. Ring network

8. Which type of network suffers the most from data collisions?
A. All networks
B. Ring network
C. Star network
D. Bus network

Focus on vocabulary Word families

Complete the following table with the correct parts of speech. Most of the answers appear in the texts in this unit.

Verbs	Nouns
Access	
Connect	
	Direction
	Failure
Implement	
	Transmission
Attach	
	Collection
Arrange	

Noun Formation

Some nouns can be derived from other words by adding a suffix. Some of the common noun endings are:

fail	⟷	fail**ure**	perform	⟷	perform**ance**
initiate	⟷	initiat**ive**	store	⟷	stor**age**
recruit	⟷	recruit**ment**	train	⟷	train**ing**
refer	⟷	refer**ence**	promote	⟷	promot**ion**

Some nouns have the same form as verbs. For example:
copy access support cost share

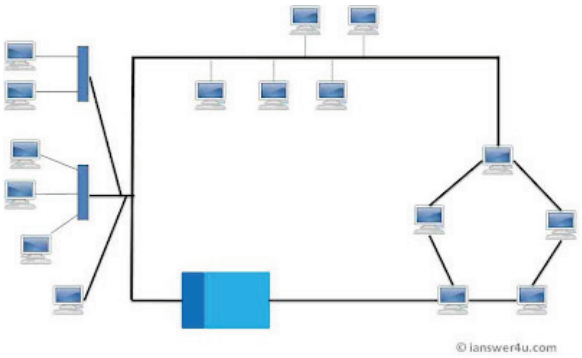
Speaking: Case study

Provide a solution to the problem using second conditional.

If the main cable or trunk between each of the two star topology networks failed, what would happen? Which topology would enable communication in this situation?

HYBRID NETWORK TOPOLOGY

Reading



Hybrid, as the name suggests, is mixture of two different things. Similarly in this type of topology we integrate two or more different topologies to form a resultant topology which has good points (as well as weaknesses) of all the constituent basic topologies rather than having characteristics of one specific topology. This combination of topologies is done according to the requirements of the organization.
For example, if there exists a ring topology in one office department while a bus topology in another department, connecting these two will result in Hybrid topology. Remember connecting two similar topologies cannot be termed as Hybrid topology. Star-Ring and Star-Bus networks are most common examples of hybrid network.

(Source: http://www.canswer4u.com/2012/05/hybrid-topology-advantages-and.html#axzz2QSmLpW43)

Let's see the benefits and drawbacks of this networking architecture

Advantages of Hybrid Network Topology

1) **Reliable:** Unlike other networks, fault detection and troubleshooting is easy in this type of topology. The part in which fault is detected can be isolated from the rest of network and required corrective measures can be taken, WITHOUT affecting the functioning of rest of the network.

2) **Scalable:** It's easy to increase the size of network by adding new components, without disturbing existing architecture.

3) **Flexible:** Hybrid Network can be designed according to the requirements of the organization and by optimizing the available resources. Special care can be given to nodes where traffic is high as well as where chances of fault are high.

4) **Effective:** Hybrid topology is the combination of two or more topologies, so we can design it in such a way that strengths of constituent topologies are maximized while there weaknesses are neutralized. For example we saw Ring Topology has good data reliability (achieved by use of tokens) and Star topology has high tolerance capability (as each node is not directly connected to other but through central device), so these two can be used effectively in hybrid star-ring topology.

Disadvantages of Hybrid Topology

1) **Complexity of Design:** One of the biggest drawback of hybrid topology is its design. It's not easy to design this type of architecture and its a tough job for designers. Configuration and installation process needs to be very efficient.

2) **Costly Hub:** The hubs used to connect two distinct networks, are very expensive. These hubs are different from usual hubs as they need to be intelligent enough to work with different architectures and should be function even if a part of network is down.

3) **Costly Infrastructure:** As hybrid architectures are usually larger in scale, they require a lot of cables, cooling systems, sophisticate network devices, etc.

Reading Activity: Answer the questions below

1: What is Hybrid topology?

2. What are the most common examples of hybrid topology?

3. What are the advantages and disadvantages of this topology?

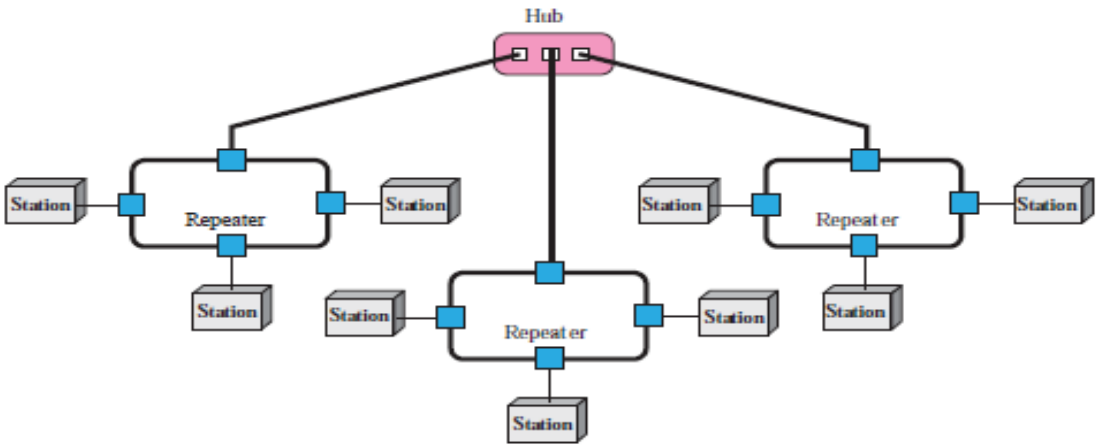
4. Why can hybrid topology be reliable and effective?

5. Why can hybrid topology be scalable and flexible?

Case study

Draw the hybrid topology for the following specification
a) with a star backbone and three bus networks .at each bus three workstations are connected show the hub ,drop line and taps.
b) with a star backbone and two ring networks, at each ring network three stations are connected. Show the hub and repeater.
Give the benefits and drawbacks of this network architecture.

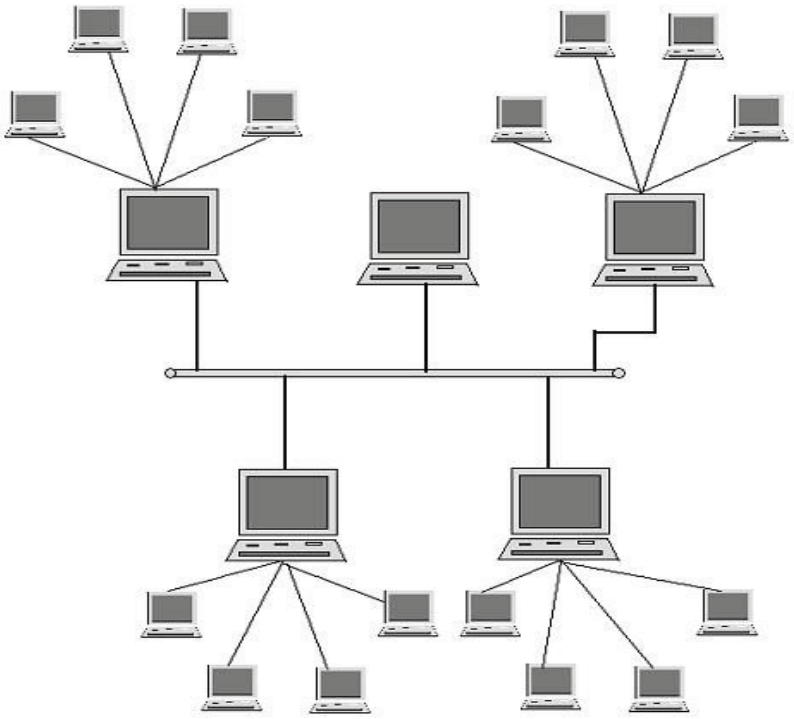
1. Draw hybrid topology with a star backbone and three ring network?



2- Hybrid computers are computer systems that contain both digital and analog devices, so that each of these properties can be utilized to the maximum advantage.
3- What is difference between tree and hybrid topology?
No difference... tree and hybrid are same.
4- A *hybrid topology* combines the features of the bus and ring topologies with the star topology by shrinking the actual *bus* or *ring* into a small box called a *hub* which serves the purpose of the central connection point or *star*.
5- Hybrid networks use a combination of any two or more topologies in such away that the resulting network does not exhibit one of the standard topologies:

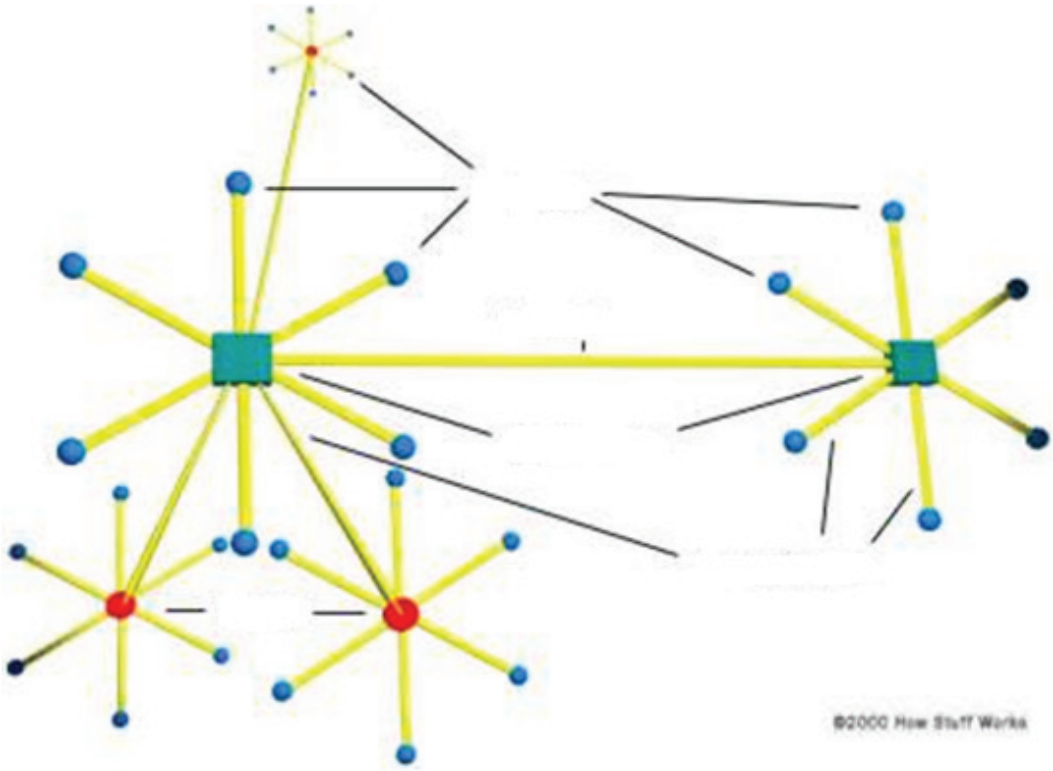
a- **1**
b- **2**
c- **3**
d- **Two or more**

6.- Determine the type of topology:



Homework

Use this scheme to name the elements that form the mix topology



LESSON PLAN WEEK 9/10 TOPIC: CABLE TRANSMISSION MEDIA

Learning objectives: By the end of the lesson students will be better able to:

1. **Identify and describe the functions of cables and their parts**
2. **Improve their oral fluency in describing the functions of network cables and network cabling**
3. **Use specialist vocabulary to explain and define cable transmission techniques**
4. **Recognize a range of suffixes for forming adjectives to aid understanding of a text**
5. **Write a list of instructions on how to fix cables**
6. **Compare and contrast different cables (coaxial, shielding, twisted pair cables) using a range of intensifiers (much more, far more etc.)**
7. **Use the correct order of adjectives to write a descriptive paragraph**
8. **Use 'ing' & 'ed' adjectives with greater accuracy**

Activity	Differentiation	Interaction	How learning will be checked / assessed
1. Introduce learning objectives – explain learning outcomes.			Vocabulary
2. **Reading *Cable Transmission Media: Use of copper*** • Lead-in: Brainstorm what students know about cables. • Students divided into three groups to read the material • Students share the information gained from the text.	Less independent	T-Ss Ss-Ss	Monitoring
3. **Language: Parts of speech** • Students identify the part of speech of the underline words • Teacher explains how the underlined words are formed (prefixes, suffixes) • Pair work, matching exercise	More independent	T-Ss Ss-Ss	Matching exercise
4. Language: Suffixes with adjectives • T introduces activity • Students in pairs think of more –ed/-ing adjectives • Students complete gap fill with adjective		T-Ss Ss-Ss	Gap fill exercise
5. Reading: Types of cables • Student read text and label parts of a cable			
6. Writing: Describing cables • Students group adjectives according to type • Students write a descriptive paragraph	Independent	Ss-Ss	Written paragraph
7. **Reading: Cable Categories** • Students read text • Match definitions to words highlighted in text			
8. Reading: Cees Links • Before reading Students write what they know about Cees Links. • Ask questions to other students to find out more information, • Read text & do research and write down what they have found out.			Written paragraph
9. Integrated Skills • Students listen to video • Group work - students prepare instructions on how to fix cables • Small groups - some students demonstrate how to fix cables • Teacher monitors the activity and assists • Students compare and contrast cables	Independent	T-Ss	

HOMEWORK:	Students will produce a video to describe cables /their functions

USE OF COPPER

Reading Activity

Copper has been used in electric wiring since the invention of the electromagnet and the telegraph in the 1820s. The invention of the telephone in 1876 created further demand for copper wire as an electrical conductor.
Today, despite competition from other materials, copper remains the preferred electrical conductor in nearly all categories of electrical wiring. For example, copper wire is used in power generation, power transmission, power distribution, telecommunications, electronics circuitry, and countless types of electrical equipment. Aside from electrical conductors, other important electrical applications for copper include electrical contacts and resistors. Electrical wiring in buildings is the most important market for the copper industry. Roughly half of all copper mined is used to manufacture electrical wire and cable conductors.

(Source: http://en.wikipedia.org/wiki/Copper_wire_and_cable)

Focus on language: Parts of Speech Activity

Identify the part of speech of the underlined words and then look their meaning up in the dictionary. Make sentences with the words.

WORDS	PART OF SPEECH	MEANING
Invention		
Conductor		
competition		
Electrical		
Generation		
transmission		
Distribution		
Countless		
Applications		
Roughly		

Language Activity – Common suffixes with adjectives

In the previous lesson we looked at common suffixes with nouns. Now we are going to examine **common suffixes with adjectives**.

Suffix	Examples
-ous / - ious	Ambitious famous envious anxious
-al	Physical professional international
-ive	exclusive supportive competitive

-able	Profitable adjustable workable
-ible	Responsible deductible negligible
*-ed**	Talented determined produced
*-ing**	Challenging inspiring pioneering
-ful	Careful successful fruitful
-ent/-ant	Relevant important confident
-ic	Electronic economic realistic
-y	Busy risky wealthy

*** A large number of adjectives to describe feelings have both an –ing and an –ed form.**

inspired / inspiring **disappointed / disappointing**

Can you think of any others?
The *–ed* form describes how you feel.
I'm always inspired when I read about people like Bill Gates.
The *–ing* form describes what makes you feel that way.
The work Bill Gates does for charity is really inspiring.
But remember, not all –ed / -ing adjectives have both forms.
The IT technician looks a bit stressed. His jobs is very stressful.

Adjective formation: Complete the job reference below with the correct form of the word in brackets

As requested, this is an appreciation of Ms Jones who spent four years working in my department. IT Maestro is a highly .....1 (success) company specialising in providing IT support in a highly .....2 (compete) market. During her time with IT Maestro, Ms Jones worked with our computer systems support team and was .....3 (responsibility) for maintaining, updating and modifying the software used by our clients. This work requires someone who is self-.....4 (motivate) and has .....5 (deduce) ability for analysing faults. In addition, Ms Jones demonstrated that she has excellent communication skills, ...6 (experience) in dealing with our clients and with working as part of a team. Ms Jones proved to be an extremely ..... (competence) ..... (loyalty) employee and I fully recommend her for the position.

(Adapted from: Strutt, Market Leader: Business Grammar and Usage, 2000)

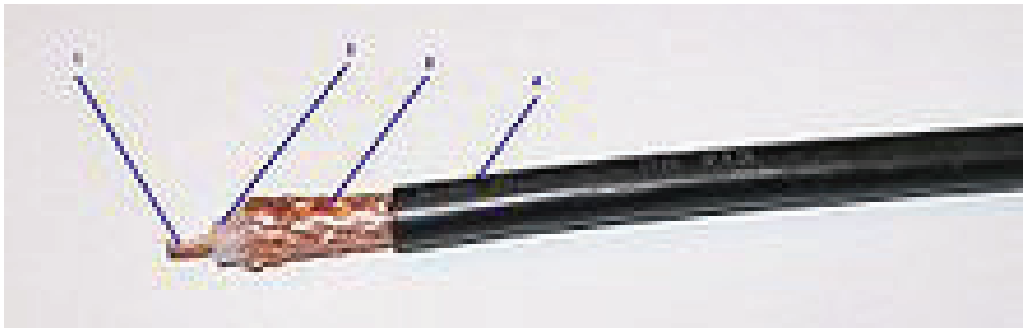
TYPES OF CABLES

Reading Activity

Shielding cables
Shielding cables are encased in foil or wire mesh. The wires inside the shielding are mostly decoupled from external electric fields. Simple shielding is not too effective against low-frequency magnetic fields, resulting, for example, in a magnetic "hum" from a nearby power transformer.

Twisted pair cables
Twisted pair cabling is a type of wiring in which two conductors (the forward and return conductors of a single circuit) are twisted together to cancel out electromagnetic interference (EMI) from external sources and reduce signal loss. This is why twisted pairs have been used in telephone communications for many decades.

Coaxial cables

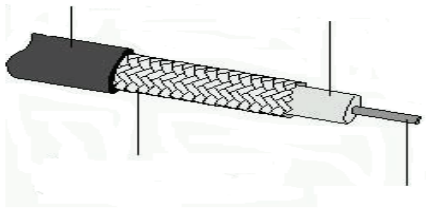


Flexible RG-213 type coaxial cable

Coaxial cables reduce low-frequency magnetic transmission and pickup. They consist of two or more wires that are wrapped concentrically and separated by a dielectric insulation material. The term, coaxial, was coined because the centre conductor and the outer conductor, or shield, form concentric cylinders. This causes voltages induced by a magnetic field between the shield and the core conductor to consist of two nearly equal magnitudes which cancel out each other. The centre conductor of a coaxial cable may be a single strand or it may be stranded.
Common conductor materials used in coaxial cables include copper, tinned or silver plated copper, copper-clad steel, and copper-clad aluminium. Less frequently, aluminium is used as an alternate inner conductor. The outer conductor is typically made from a woven copper wire mesh braid shield layer, or less frequently, aluminium foil. This layer also gives the wire protection from interference. The cables are insulated with a flexible, tubular insulating layer made from polyethylene (PE), polypropylene (PP), fluorinated ethylene propylene (FEP) or polytetrafluoroethylene (PTFE).
The advantage of coaxial design is that the electric and magnetic fields are confined to the dielectric with little leakage outside the shield. Conversely, electric and magnetic fields outside the cable are largely kept from causing interference to signals inside the cable. This property makes coaxial cable a good choice for carrying weak signals that cannot tolerate interference from the environment or for higher power signals that must not be allowed to radiate or couple into adjacent structures or circuits.

(Source: http://en.wikipedia.org/wiki/User:Enviromet/Subpage_5_-_Copper_in_wire_and_cable #Shielding_cables)

Exercise: Name the parts of the cable by using words in the box.

	Copper wire mesh or aluminium sleeve conducting core Outer shield insulation (PVC, Teflon)

Writing Activity

Describing objects

When you describe objects you can use a variety of adjectives.
Opinion adjectives go before fact adjectives. When there are two or more fact adjectives in a sentence, they usually go in the following order.

Opinion	Size	Age	Shape	Colour	Origin	Material	Noun

Group the adjectives according to the headings:

Copper; silver; aluminium; Chinese; large; twisted; fluorescent; light; magnetic; electric; weak; flexible; tubular; red; old; heavy; interesting; oval; red; Albanian; ceramic; wooden; square; plastic; leather; large; small.

Opinion	Size/Weight	Age	Shape	Colour	Origin	Material

Writing Activity

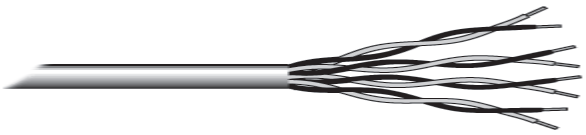
Describe at least two cables

CABLE CATEGORIES

WHAT IS NETWORK CABLING?

Cable is the medium through which information usually moves from one network **device** to another. There are several types of cable which are commonly used with LANs. In some cases, a **network** will utilize only one type of cable, other networks will use a variety of cable types. The type of cable chosen for a network is related to the network's topology, protocol, and size. Understanding the characteristics of different types of cable and how they relate to other aspects of a network is necessary for the development of a successful network.
The following sections discuss the types of cables used in networks and other related topics.

- Unshielded Twisted Pair (UTP) Cable
- **Shielded** Twisted Pair (STP) Cable
- Coaxial Cable
- Fibber Optic Cable
- Cable Installation Guides
- Wireless LANs
- Unshielded Twisted Pair (UTP) Cable



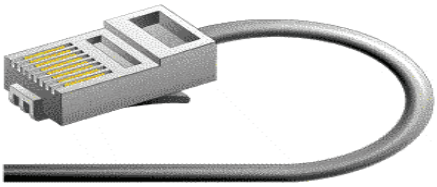
Unshielded twisted pair

Twisted pair cabling comes in two varieties: shielded and unshielded. Unshielded twisted pair (UTP) is the most popular and is generally the best option for school networks.

The quality of UTP may vary from telephone-grade **wire** to extremely high-speed cable. The cable has four pairs of wires inside the jacket. Each pair is t**wisted** with a different number of twists per inch to help eliminate **interference** from adjacent pairs and other electrical devices. The tighter the twisting, the higher the supported transmission rate and the greater the cost per foot. The EIA/TIA (Electronic Industry Association/Telecommunication Industry Association) has established standards of UTP and rated six categories of wire (additional categories are emerging).

Unshielded Twisted Pair Connector

The standard connector for unshielded twisted pair cabling is an RJ-45 connector. This is a plastic connector that looks like a large telephone-style connector. A slot allows the RJ-45 to be inserted only one way. RJ stands for Registered Jack, implying that the connector follows a standard borrowed from the telephone industry. This standard designates which wire goes with each pin inside the **connector**.



RJ-45 connector

Shielded Twisted Pair (STP) Cable

Although UTP cable is the least expensive cable, it may be **susceptible** to radio and electrical frequency interference (it should not be too close to electric motors, fluorescent lights, etc.). If you place cable in environments with lots of potential interference, or if you place cable in extremely sensitive environments that may be susceptible to the electrical current in the UTP, shielded twisted pair is the solution. Shielded cables can also help to **extend** the maximum distance of the cables.
Shielded twisted pair cable is available in three different configurations:

1. Each pair of wires is individually shielded with foil.
2. There is a foil or braid shield inside the jacket covering all wires (as a group).
3. There is a shield around each individual pair, as well as around the entire group of wires (referred to as double shield twisted pair).

(Source: http://fcit.usf.edu/network/chap4/chap4.htm)

Vocabulary exercise

Match the words in bold to their definitions, then make sentences of your own with the words.

Metal in the form of thin thread/ to protect something from danger or hurt/an object or a piece of equipment to do a particular job/ interruption of a radio signal by another signal on a similar wave-length/a number of computers and other devices that are connected together so that equipment and information can be shared/bent or turned so that the original shape is lost/ very likely to be influenced, harmed or affected by sb or sth/ an object that joins together two or more things.

Pair work: Match Cable category with the speed and usage

Category	Speed	Use
1	1 Mbps	100BaseT Ethernet
2	4 Mbps	Gigabit Ethernet
3	16 Mbps	Gigabit Ethernet
4	20 Mbps	Voice Only (Telephone Wire)
5	100 Mbps (2 pair)	Gigabit Ethernet
	1000 Mbps (4 pair)	Local Talk & Telephone (Rarely used)
5e	1,000 Mbps	Token Ring (Rarely used)
6	10,000 Mbps	10BaseT Ethernet

Reading Activity

Cees Links

Green Peak: Founder & Chief Executive Officer

Cees ["case"] Links is a pioneer of the wireless data industry, a visionary leader bringing the world of mobile computing and continuous networking together. Under his responsibility, the first wireless LANs were developed which ultimately became house-hold technology integrated into the PCs and notebooks we are all familiar with. He also pioneered the development of access points, home networking routers and hotspot base stations, all widely used today. Cees started his career at NCR Computers where he was responsible for the development and launch of the world's first wireless LAN product in 1990, a major innovation at that time. He directly closed a deal with Apple Computer in 1999 that ignited the growth of the wireless LAN industry. Though this deal, wireless LANs went on to become a standard notebook feature.

(Source: www.greenpeak.com/company/Management.html)

The first and the second column of this table should be filled in as a pre reading activity and the third column should be completed as an after reading activity.

KNOW	WANT TO KNOW	LEARNED
(Students insert the information they know about Cees Links)	(Students ask questions on what they want to know about Cees Links)	(After reading the text and doing research on the internet they fill the column with the appropriate information)

Integrated skills Activity: *http://www.youtube.com/watch?v=hvnH5qd0QSE*

Listen to a specialist speaking about Category 5e versus Category 6 Ethernet Cable. Use degrees of adjectives to answer the following questions.

1) What is the difference between Category 5e and Category 6 Ethernet Cable?
2) Which one of the cables contains more data?
3) When is Cat 5e used?
4) When is Cat 6 used?
5) Which one lasts longer?

LESSON PLAN WEEK 11/12 TOPIC: CABLE TRANSMISSION MEDIA

Learning objectives: By the end of the lesson students will be better able to:

1. **Identify coaxial cables and their parts**
2. **Describe and demonstrate basic knowledge of fibre optic cables**
3. **Use passive forms more accurately**
4. **Use conditional sentences with imperatives to give instructions**
5. **Accurately use a range of verb /preposition combinations**
6. **Talk about inventions and the influence they have had in people's lives**
7. **Structure a report appropriate for the task**
8. **Give guidelines on procedures**
9. **Select key points and language for effective power point presentations**

Activity	Differentiation	Interaction	How learning will be checked / assessed
1. Introduce learning objectives – explain learning outcomes.	Less independent	T-Ss	Revision vocabulary
2. Reading: How cable television works. • Students read the text & ask and answer questions	More independent	Ss-Ss	Quiz/vocabulary
3. Grammar: so /such • Students complete exercises for practice	Less independent		
4. Reading: *Coaxial cables* • *Students complete gap-fill vocabulary exercise*		T-Ss	Written sentences
5. Listening & Speaking: Video • Class is divided into small groups; introduce students to the material • Show functions of coaxial cable /discuss specialist vocabulary/explanation of key words • Listen to video for specific information	More independent	Ss-Ss	Gap fill
6. Reading: History of Coaxial cables • Students read text • Put passive forms in text into active.			Integrated skills
7. Specialist Vocabulary • Students match pictures to words		Ss-Ss	
8. Reading & Discussion: Fibber optic cable • Students search different inventions and share information with friends • Student tell/write a story on their favourite invention		T-Ss Ss-Ss	Grammar exercise
9. Reading: Fibber optic cabling • Multiple choice mini-test			
10. Speaking/writing • Small groups ,students provide guidelines on installing cables • Using 0 conditional sentences when giving guidelines			Writing a story
11. Writing: a report • In pairs students place cut up report into correct order • Identify passives & if sentences in report • Write a report using information obtained from two websites.			Written report
HOMEWORK:	Students will produce a power point presentation/video on how to prepare and install a television aerial		

HOW CABLE TELEVISION WORKS

Read the text and fill in the gaps with an appropriate word.
Compare answers with a partner.

In the 1950s, there were four television networks in the United States. Because (1) ___the frequencies allotted to television, the signals could only be received in a "line of sight" from the transmitting antenna. People living (2) ___ remote areas, especially remote mountainous areas, couldn't see the programs that were already becoming an important part of U.S. culture.
(3) _____1948, people living in remote valleys in Pennsylvania solved (4)_____ reception problems by putting antennas on hills and running cables to their houses. These days, the same technology once used (5)_____ remote hamlets and select cities allows viewers all over the country (6)_____ access a wide variety of programs and channels that meet their individual needs and desires. By the early 1990s, cable television (7) _____ reached nearly half the homes in the United States.
Today, U.S. cable systems deliver hundreds of channels to some 60 million homes, while also providing a growing number of people with high-speed Internet access. Some cable systems even let you make telephone calls and receive new programming technologies! **Cable television brings you so much information and such a wide range of programs,** from educational (8) _____ inspirational ones.
The earliest cable systems were strategically placed by antennas with very long **cables** connecting them to subscribers' television sets. Because the signal from the antenna became weaker as it travelled (9)_____ the length of cable, cable providers had (10)_____ insert **amplifiers** at regular intervals to boost the strength of the signal and make (11)_____ acceptable for viewing. Limitations in these amplifiers were a significant issue for cable system designers in the next three decades.
In a cable system, the signal might have gone through 30 or 40 amplifiers before reaching your house, one every 1,000 feet or so. With each amplifier, you would get noise and distortion. Plus, if one of the amplifiers failed, you lost the picture. Cable got a reputation (12) _____ not having the best quality picture and for not being re liable. In the late 1970s, cable television would find a solution (13) _____ the amplifier problem. By then, they had also developed technology that allowed them to add more programming to cable service.

(Source: http://www.howstuffworks.com/cable-tv.htm)

Reading comprehension and speaking exercise

- Ask and answer questions about the text.
- Mention three things that you can remember from the text.

Grammar Activity: so/such ....that

Read the sentence in bold in the above text.
What is the grammatical difference between *so* and *such*?
Check with the rules. See below

So+adjective/adverb	*Such+a/an+adjective+noun*
It`s so hot today! You drive so quickly! He eats so much!	It`s such a nice day. He`s such an awful driver! There is such a lot of information.
We often use ***So/such .... that*** to express a consequence	

Complete with *so/such* or *such a/an*.

1. Why did you buy _____ expensive computer?
2. Electrical wiring in buildings is _____ important market for the copper industry.
3. Unshielded twisted pair (UTP) is _____ popular and is generally the best option for school networks.
4. We didn`t expect the sales to be _____ good in February.

Match the sentences. Then write one sentence with so or such (a/an).

1	He ran the company badly.	A	He does not know what to do with it all.
2	It`s a good advert.	B	She sounds like a native speaker.
3	Her French accent is very good.	C	It made huge loses.
4	I was exhausted.	D	No one wants to sit next to him.
5	He is boring.	E	It makes me want to buy the product.
6	He`s made a lot of money.	F	I went to bed early.

COAXIAL CABLE

Reading

Coaxial cabling has a single copper conductor at its centre. A plastic layer provides insulation between the center conductor and a braided metal shield. The metal shield helps to block any outside interference from fluorescent lights, motors, and other computers.

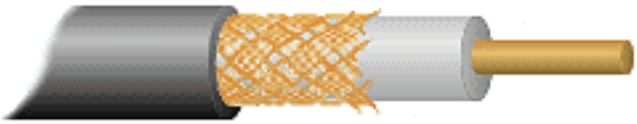


Fig. Coaxial cable

Although coaxial cabling is difficult to install, it is highly resistant to signal interference. In addition, it can support greater cable lengths between network devices than twisted pair cable. The two types of coaxial cabling are thick coaxial and thin coaxial.

Thin coaxial cable is also referred to as thin net. Thin coaxial cable has been popular in school networks, especially linear bus networks.

Thick coaxial cable is also referred to as thick net. Thick coaxial cable has an extra protective plastic cover that helps keep moisture away from the centre conductor. This makes thick coaxial a great choice when running longer lengths in a linear bus network. One disadvantage of thick coaxial is that it does not bend easily and is difficult to install.

Coaxial Cable Connectors

The most common type of connector used with coaxial cables is the Bayone-Neill-Concelman (BNC) connector. Different types of adapters are available for BNC connectors, including a T-connector, barrel connector, and terminator. Connectors on the cable are the weakest points in any network. To help avoid problems with your network, always use the BNC connectors that crimp, rather screw, onto the cable.

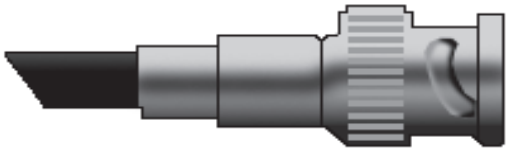


Fig. BNC connector

Cross-section of coaxial copper cable.

Coaxial cables were extensively used in mainframe computer systems and were the first type of major cable used for Local Area Networks (LAN). Common applications for coaxial cable today include computer network (Internet) and instrumentation data connections, video and CATV distribution, RF and microwave transmission, and feed lines connecting radio transmitters and receivers with their antennas.

In copper twisted pair wire networks, copper cable certification is achieved through a thorough series of tests in accordance with Telecommunications Industry Association (TIA) or International Organization for Standardization (ISO) standards. These tests are done using a certification-testing tool, which provide “Pass” or “Fail” information. While certification can be performed by the owner of the network, certification is primarily done by data-com contractors. It is this certification that allows the contractors to warranty their work.

Introduction to coaxial cables

Perhaps none of us has ever thought that the development of radio communications would have never been possible without the invention of coaxial cable. It is continuously used in our applications that we don't think about that. The attribution of the invention of coaxial cable is complex and contrasted. There are several American and European patents already near the end of 1800s (the first patent is in 1880 by O. Heaviside UK). The discovery then fell into obscurity for many years because surely there was nothing to make pass in a coaxial cable!! The real discovery and its actual use dates back in 1929 due to the need for a more efficient and with less interferences conductor for the transmissions of many telephone channels on a single "carrier". In the early 30s, this technique was also advantageously used for the first experiments with the emerging television and so on until today.

(Source: http://members.tripod.com/barhoush_2/cabling.htm#Coaxial)

Vocabulary Exercise

Fill in: *linear, copper, twisted, signal, braided, plastic.*
Then make sentences based on the text using the phrases.

1. .....conductor
2. .....layer
3. .....metal shield
4. .....pair cable.
5. .....interference
6. .....bus network

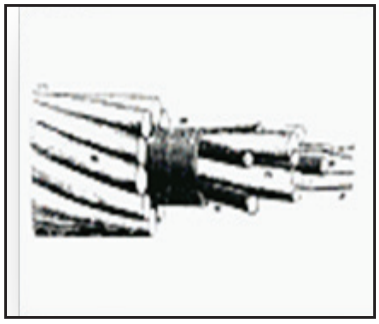
Listening and speaking activity (http://youtu.be/nKEvciE5G7c)

Students listen to a video on how to prepare a coaxial cable, then they are divided into groups and each group is given different questions to be answered.

For example:

What are the tools used in the video?
What things should be kept in mind while preparing coaxial cable?
What was the little tip about?

COAXIAL CABLE HISTORY



Coaxial cable was invented in 1929 and first used commercially in 1941. AT&T established its first cross-continental coaxial transmission system in 1940.
Government and military applications summoned in the further development of coaxial cables. Built to military specifications and classified according to Radio Guide Utility (RG/U) numbers, these products were developed to help support high frequency radio transmissions. The steady growth of the computer industry further developed the need for coaxial cables for commercial use. Manufacturers of "proprietary" system demanded a variety of unique cable designs.
The first major installation in Australia of coaxial cable was in the early 1960s, when the first broadband link joining Sydney, Canberra and Melbourne was constructed. The link opened for traffic in April 1962. The cable laid between these centres was made up of six coaxial tubes and 32 pairs of other wires, and had a potential capacity of thousands of simultaneous telephone calls, in addition to being able to relay television programs. Presently, coaxial cables are installed in underground ducts in metropolitan areas. However, in country areas, and over long-distance routes, the cable is buried about a meter deep along its route. Rather larger excavations have to be made for the underground housings for the repeater equipment, into which the cable is led and jointed.

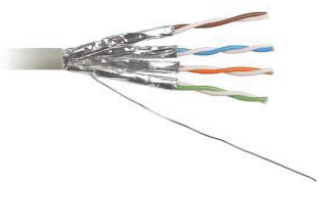
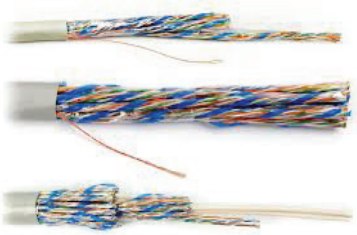
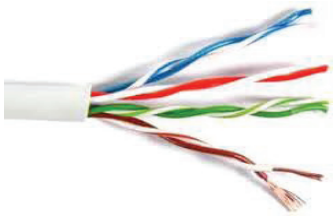
(Source: http://www.colemancable.com/support/faq-technical-specs/faq-coax.aspx)

Grammar Activity: Passive / Active Form
Exercise: Underline all the passive forms in the text. Turn them into active.

Specialist Vocabulary Exercise:

Match the words in the box with the pictures:

unshielded twisted pair utp cable; shielded twisted pair stp cable ; coaxial cable; fibber optic cable; cable installation guides; wireless lans; shielded twisted pair utp cable



FIBER OPTIC CABLE

Reading Activity

History

In 1880 Alexander Graham Bell and his assistant Charles Sumner Tainter created a very early precursor to fibber-optic communications, the Photo phone, at Bell's newly established Volta Laboratory in Washington, D.C. Bell considered it his most important invention. The device allowed for the transmission of sound on a beam of light. On June 3, 1880, Bell conducted the world's first wireless telephone transmission between two buildings, some 213 meters apart. Due to its use of an atmospheric transmission medium, the Photo phone would not prove practical until advances in laser and optical fibber technologies permitted the secure transport of light. The Photo phone's first practical use came in military communication systems many decades later.

In the late 1990s through 2000, industry promoters, and research companies such as KMI, and RHK predicted massive increases in demand for communications bandwidth due to increased use of the Internet, and commercialization of various bandwidth-intensive consumer services, such as video on demand. Internet protocol data traffic was increasing exponentially, at a faster rate than integrated circuit complexity had increased under Moore's Law. From the bust of the dot-com bubble through 2006, however, the main trend in the industry has been the consolidation of firms and off-shoring of manufacturing to reduce costs. Companies such as Verizon and AT&T have taken advantage of fibber-optic communications to deliver a variety of high-throughput data and broadband services to consumers' homes.

(Source: https://classes.lt.unt.edu/.../FiberOpticBackbone.docx)

Topics for discussion:

- Which are some of the most important inventions of the century?
- How have inventions influenced people's life?
- Search on the internet about inventors and inventions and share the information with friends.
- Are there disadvantages to inventions? (http://www.teachingenglish.org.uk/activities/inventions)

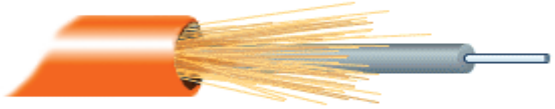
Reading Activity

Fibre Optic Cabling

Fibber optic cabling consists of a centre glass core surrounded by several layers of protective materials. It transmits light rather than electronic signals eliminating the problem of electrical interference. This makes it ideal for certain environments that contain a large amount of electrical interference. It has also made it the standard for connecting networks between buildings, due to its immunity to the effects of moisture and lighting.

Fibber optic cable has the ability to transmit signals over much longer distances than coaxial and twisted pair. It also has the capability to carry information at vastly greater speeds. This capacity broadens communication possibilities to include services such as video conferencing and interactive services. The cost of fibber optic cabling is comparable to copper cabling; however, it is more difficult to install and modify. 10BaseF refers to the specifications for fibber optic cable carrying Ethernet signals.

The centre core of fibber cables is made from glass or plastic fibbers (see fig 5). A plastic coating then cushions the fibber centre, and Kevlar fibbers help to strengthen the cables and prevent breakage. The outer insulating jacket made of Teflon or PVC. There are two common types of fibber cables -- single mode and multimode. Multimode cable has a larger diameter; however, both cables provide high bandwidth at high speeds. Single mode can provide more distance, but it is more expensive.



Fibber optic cable

Installing Cable - Some Guidelines

When running cable, it is best to follow a few simple rules. Use O conditional to write other gudelines.

- Always use more cable than you need. Leave plenty of slack.
- Test every part of a network as you install it. Even if it is brand new, it may have problems that will be difficult to isolate later.
- Stay at least 3 feet away from fluorescent light boxes and other sources of electrical interference.
- If it is necessary to run cable across the floor, cover the cable with cable protectors.
- Label both ends of each cable.
- Use cable ties (not tape) to keep cables in the same location together.

Do you know that ...

Corning Incorporated is an American manufacturer of glass and ceramics. In 2007 Corning introduced an optic fibber, Clear Curve, which uses nanostructure technology to facilitate the small radius bending found in FTTX installations.

Gorilla Glass, which is a high-strength alkali-aluminosilicate thin sheet glass used as a protective cover glass offering scratch resistance and durability in many handheld devices with touch screens, went on sale in 2008.

Gorilla Glass was used in the first iPhone released in 2007 according to the book “Steve Jobs” by Walter Isaacson. Friend John Seeley Brown, who was on the board of Corning Glass in Upstate New York, told him that he should talk to that company’s young and dynamic CEO, Wendell Weeks. Corning’s facility in Harrisburg, Kentucky, which had been making LCD displays, was converted almost overnight to make gorilla glass full-time. “We put our best scientists and engineers on it, and we just made it work.” In his airy office, Weeks has just one framed memento on display. It’s a message Jobs sent the day the iPhone came out: “We couldn’t have done it without you.”

Mini test

Exercise: Choose the words to fit in the gap:

1. Transmission media are usually categorized as _____.
   - guided or unguided
   - fixed or unfixed
   - determinate or indeterminate
   - metallic or non-metallic
2. _____ cable consists of an inner copper core and a second conducting outer sheath.
   - Twisted pair
   - Coaxial
   - Fibber Optic
   - Shielded Twisted Pair
3. In fibber optics, the signal is _____ waves.
   - Light
   - Radio
   - Infrared
   - Very low frequency
4. In an optical fibber, the inner core is _____ the cladding.
   - denser than
   - less dense than
   - the same density as
   - another name for

5. The inner core of an optical fibber is _____ in composition.
   - Glass or plastic
   - Copper
   - Bimetallic
   - Liquid
6. __ cable consists of two insulated copper wires twisted together.
   - Coaxial
   - Fibber Optic
   - Twisted pair
   - None of the above
7. _____ consists of a central conductor and a shield.
   - Coaxial
   - Fibber Optic
   - Twisted pair
   - None of the above
8. _____ cables carry data signals in the form of light.
   - Coaxial
   - Fibber Optic
   - Twisted pair
   - None of the above

Writing Activity: Writing a Report (1)
In pairs read the cut up sections of a report on *Office Health and Safety*.
Put the sections into the correct order.

To: Ms Renoir, Managing Director

From: Joe Smith **Date:** 28/03/13

Office Health and Safety

Introduction

The aim of this report is to make recommendations for improving the Health and Safety of employees of JJB & Co. This report was requested by the Managing Director on 14/02/13.

Main Findings

A study was made of all job-related illnesses during the past year. For example, it was found that a number of cases of symptoms of Repetitive Strain Injury (RSI) had been reported by the company physiotherapist. Other injuries were caused by poor furniture and equipment. In addition, poor ventilation makes the workplace uncomfortable. Many members of staff were not aware of health and safety procedures. Meetings were held with union representatives and office managers to discuss what could be done.

Recommendations

1. The safety regulations should be clearly displayed in the company's canteen and main offices.
2. New staff should be made aware of the company's safety regulations and policy. In particular, they should be advised to take frequent breaks from computer screens.
3. Staff should be taught how to position themselves, their chairs, desks and equipment.
4. The health and safety committee should be responsible for training staff to use office equipment.
5. Ventilation and air-filtering systems need to be maintained on a regular basis.
6. The union suggested that furniture and equipment should be replaced. In particular:
    a. Old-fashioned screens should be replaced
    b. Office lighting should be checked
    c. Chairs with full back supports are essential

Conclusion

At present many health and safety regulations are being broken. The action needed on these issues has been found to be urgent and, as a result, the above recommendations should be acted upon as soon as possible.

(Order of report)
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Writing Activity: Writing a Report (2)

In pairs discuss the key points of report-writing. Think about:

- layout
- style / formality
- language

Writing Activity: Writing a Report (3)

Read the Language Review below and then underline all the examples of the *passive* and the use of *it* in the report.

Language Review

When writing in a formal style (e.g. reports) we often choose an impersonal style by using the **passive** and beginning sentences with **it**.

It was agreed to install a LAN in the college.
It was considered to be the most viable option.

Another way of reporting what is said or thought is to use it + passive + that-clause.

It was agreed that the number of lap tops for student-use should be increased.

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Writing activity: Writing a report (4)

You are now going to write a report about health problems associated with the regular use of computers.

The Task:

You work for the company IT Maestro which provides IT support to small businesses. One of its clients, ABS Enterprises, has recently had a large number of its employees being off work due to problems commonly related to poor computer health and safety. These are:

- upper limb disorder
- eye strain,
- headaches
- stress & fatigue.

Your manager, at IT Maestro, has asked you to write a report for ABS Enterprises recommending changes the company should make to try and improve its employees' sickness record.

LESSON PLAN WEEK 13/14 TOPIC: ACTIVE COMPONENTS OF THE NETWORK

Learning objectives: By the end of the lesson students will be better able to:

1. **Identify and describe functions of switches, repeaters, bridges and routers (SOHO & Enterprise routers)**
2. **Demonstrate basic knowledge on networks by asking for and giving advice**
3. **Use a range of phrasal verbs commonly used in telephone conversations**
4. **Use narrative tenses to speak about technological developments**
5. **Use adverbs of frequency and manner with greater accuracy**
6. **Listen for specific information**
7. **Extract and summarize key information from a text**

Activity	Differentiation	Interaction	How learning will be checked / assessed
1. Introduce learning objectives – explain learning outcomes.	Less independent	T – Ss	Practice vocabulary
2. Reading: Switches, hubs & repeaters • Lead-in: Brainstorm on what students know about switches, hubs etc, their history and related vocabulary. • Group work- students in groups work on the reading activities	Independent Less independent	Ss-Ss T-Ss	Qs & As
3. Reading: History of switches • Students read text and complete reading activities • Teachers explains meanings of new words • In groups students discuss the main points in the development of switches. Students change groups and exchange information	More independent More independent	Ss-Ss Ss-Ss	Integrated skills
4. Case study: Vodaphone Albania • In groups students complete the scenario.		T-Ss	Dialogue
5. Listening & Speaking: Video • Students listen to the video and answer the questions • Pair work-dialogue. Prepare an interview the specialist in the video		Ss-Ss Ss-Ss	Histories Role Play
6. Reading: history of routers • students read the history of routers and do the true or false exercise • teacher focuses on the acronyms used in the texts • Students do research and tell different related histories	More independent	Ss-Ss Ss-Ss	Summary Qs & As
7. Role Play: Telephoning • Student complete activities to practice telephone language • In pairs student prepare and act out telephone conversation – asking for advice from an IT specialist			
8. Writing: Summary • Students make a summary of the history of switches using Spider Scribe.			
9. Listening & speaking: Video on *Bridges* • students watch the video and answer the questions			

HOMEWORK:	Use glogsters to create an interactive online poster http://www.teachingenglish.org.uk/activities/using-glogster-creating-interactive-online-posters

SWITCHES, HUBS AND REPEATERS

Reading Activity

Read the text about switches, hubs and repeaters. Choose from the sentences (A-D) the one which fits each gap (1-4).

A. Repeaters are used to establish Ethernet network.
B. Switches provide these functions by using various link-layer protocols.
C. The purpose of these hubs is to preserve the space in an operation room or office.
D. A hub provides the signal amplification required to allow a segment to be extended a greater distance.

Switches: LAN switches are an expansion of the concept in LAN bridging, which controls data flow, handles transmission errors, provides physical addressing, and manages access to the physical medium. (1) - ( ) LAN switches can link four, six, ten or more networks together. A store-and-forward switch, on the other hand, accepts and analyses the entire packet before forwarding it to its destination.

Switches are dedicated, active and smart devices they work much more efficiently than the other network devices. Switches are used to build micro segments in the network.

Hubs/Repeaters are used to connect together two or more network segments of any media type. In larger design, signal quality begins to deteriorate as segment exceeds their maximum length. (2)-( )

There are three broad categories of hubs if we compare them on technical bases. Passive hubs, active hubs and intelligent hubs are three kinds of hubs most frequently used. Hubs are not often preferably used because they are considered passive devices, which do not respond to the electrical signals. Such hubs which are not capable of regenerating electrical signals to efficiently transfer data packets are known as Passive hubs. Multi port repeaters which can amplify the electric signals to deliver packet of data are known as active hubs. When active hubs are developed more to be used by companies they are known as intelligent hubs. (3)- ( ) Various hubs are set one over the other to allow enough space for the human working. Intelligent hubs can also back up media and multiple protocols.

Repeater is a powerful network device which is used to regenerate the signals, when they travel over a longer distance, so that the strength of the signal remains the same. (4)-( ) A repeater exists as the first layer of the OSI layer that is physical layer. Repeaters are used for cables which cover the needs of the 100 meters long cable. Repeaters are used to get signals from optical fibbers, copper cables and coaxial cables. The repeaters have been developed to perform more important uses such as to regenerate the microwaves from a satellite; such repeaters are named as transponders. Hence repeaters are capable of carrying electric as well as light signals.

HISTORY OF SWITCHES

Reading Activity

Read the following text about the history of switches.

1) Match the subheadings from A-D to the paragraphs from 1-4.
   - A. 1990s: The rise of data
   - B. 1920s: Switching improvements begin
   - C. 1970s: Digital electronic switching
   - D. 1940s & 1950s: Automated switching
2) In groups discuss the main points in the development of switches. Then report back to the class.

For many years, all long distance calls began with a call to an operator sitting at a toll (long-distance) switchboard. Until the 1920s, that operator wrote down the calling information provided by the customer, and then told the customer that he or she would be called back once the party was on the line. The operator then passed the information to another operator, who would look up the route that the call should take, and then build up the circuit one link at a time by connecting to operators at switchboards along the route. A typical call took seven minutes to set up. Once operators established a circuit, it was dedicated to that conversation until the end of the call.

1-_____The first major improvement was the Combined Line and Recording (CLR) method, introduced in 1926. Now, the first operator the customer spoke to was the one who built up the circuit and placed the call. For the first time, most calls were completed while the customer stayed on line. The average call completion time dropped to 2.1 minutes. International operator, New York, 1936. This operator was in charge of all calls intended for ships at sea.

In 1929, AT&T network engineers implemented the first national General Toll Switching Plan. It established a hierarchical, national network with eight interconnected regional centers across the country. More than 140 primary centers, at least one in each state, connected to the regional centers. More than 2,000 toll offices throughout the country provided connections between the primary centers and every local exchange in the country. Additional circuits provided direct connections between centers with substantial direct traffic. These additional circuits also provided alternate back-up routes. Operators no longer had to rely on massive route books to determine call paths. Now operators sent calls up (and then back down) an established hierarchical chain. A single, nationwide structure provided a solid basis for future planning and expansion as traffic grew. With some modifications, notably the addition of sectional centers in the 1950s, AT&T continued to rely on this hierarchical network until the 1980s.

2-_____Automation came to long distance switching when AT&T installed the first No. 4 crossbar switch in Philadelphia in 1943. Now a single operator built up the needed circuit by dialling a series of routing codes to instruct this automatic electromechanical switch. Dialled routing codes soon gave way to the familiar area codes, which the switch itself

could translate into the needed routing information. AT&T soon modified the switch to handle customer-dialled long distance calls; the modified design became the No. 4A crossbar switch. No. 4A crossbar switches and direct-distance dialling spread to subscribers across the country during through the 1950s. Call-completion time dropped to 10-20 seconds.

3-_____Switching technology leapt forward in 1976 with the installation of the initial AT&T 4ESS switch in Chicago. The 4ESS was simultaneously the world's first digital electronic switch and a powerful computer. Common channel signalling followed in 1977. Now the information needed to set up a call travelled over a separate digital network from the call itself. With a separate signalling network, call completion time dropped to 1-2 seconds.

Electronic switching and common channel signalling brought new flexibility to the network, and made possible advanced services such as enhanced 800 service and software-defined networks (in the latter, customers could use a portion of the AT&T network as the virtual equivalent of a private line network).

Additional 4ESS installations followed rapidly. By 1980, AT&T had 53 of the new switches in the network, and by 1984, 100. Few of the older 4A crossbar switches remained. Through the separate signalling network, all of the 4ESS switches were in direct contact with one another, and could search for available circuits in real time. Hierarchical routing gave way to dynamic non-hierarchical routing, where the 4ESS switches themselves could choose the best path between two points.

An AT&T technician replaces a circuit board in a digital interface frame of a 4ESS switch, Los Angeles, 1980. As a digital switch, the 4ESS was ready when the rise of fiber-optic transmission transformed the AT&T network into an all-digital system between the mid-1980s and the early 1990s. Calling volumes climbed steadily, increasing from 37.5 million calls per average business day in 1984 to 300 million 15 years later.

4- _____Over those 15 years the character of the traffic began to evolve from voice to data. In the 1990s, data traffic increasingly adhered to new formats — packet switching, frame relay, asynchronous transfer mode (ATM) and Internet protocol — routed via newer technologies rather than over the switched voice network. In 1999, AT&T installed its 145th and last 4ESS switch in Atlanta.

Today, data services drive the network. In 2000, the volume of data traffic on the network surpassed the volume of voice traffic. Even the word "switching" is giving way, to the broader term "connectivity," in recognition that much traffic today gets routed over systems designed to direct data flows rather than voice. And this data travels in packets, mixed with other traffic, rather than over the dedicated circuits that have carried voices since the 19th century.

(Source: http://www.corp.att.com/history/nethistory/switching.html)

Group Activity: Case study

Scenario

The customer (VODAFONE ALBANIA) plans to restructure its flat campus network, which consists of workstations and servers that are located in the central building and building A. The company is considering Ethernet switching technology as a replacement for the 10BaseT Ethernet hubs. You have been asked to determine what effect the introduction of the switches might have on the load of the links and to estimate the network's responsiveness and utilization with respect to the existing applications.

To provide some proof of future network efficiency, you will model FTP and HTTP performance on the network using shared and then switched Ethernet platforms.

Listening and speaking Activity: Video *http://youtu.be/S2AHimvbovI*

Listen to a specialist speaking about switches and answer the following questions:

- Which are some types of switches?
- What does the number of poles refer to?
- What does the number of throws refer to?
- What kind of switch do you use if you need more than a throw?
- What do you use if you want to make a connection briefly?
- Think of some questions you want to ask to this specialist.

Pair work: Prepare an interview with the specialist based on the video you just watched.

BRIDGES AND ROUTERS

Reading

Bridges: The bridge function is to connect separate homogeneous networks. Bridges map the Ethernet address of the nodes residing on each network segment and allow only necessary traffic to pass through the bridge. Bridging has historically referred to propagation of data across a device without traversing a network stack, such as TCP/IP. Two bridged networks could be treated as parts of a single subnet under Internet Protocol (IP). A wireless bridge is a hardware component used to connect two or more network segments (LANs or parts of a LAN) which are physically and logically (by protocol) separated. It does not necessarily always need to be a hardware device, as some operating systems (such as Windows, Linux, Mac OS X and FreeBSD) provide software to bridge different protocols. Many wireless routers and wireless access points offer either a "bridge" mode or a "repeater" mode, both of which perform a similar common function, the difference being the bridge mode connects two different protocol types and the repeater mode relays the same protocol type. Wireless bridge devices work in pairs (point-to-point), one on each side of the "bridge". However, there can be many simultaneous "bridges" using one central device (point to multipoint).

Routers: Routing achieved commercially popularity in the mid – 1980s – at a time when large-scale Internetworking began to replace the fairly simple, homogeneous environments. Routing is the act of moving information across an Internetwork from a source to a destination. It is often contrasted with bridging, which perform a similar function. Routers use information within each packet to route it from one LAN to another, and communicate with each other and share information that allows them to determine the best route through a complex network of many LANs.

Types of Routers

Routers are of many kinds depending on the need of the enterprises, individuals and official use. Largest routers such as Cisco **CRS**-1 and Juniper T-1600 are used to set up network of large organizations and even of the **ISPs**. Routers can be divided into three broad categories depending upon the need of the network. First of their kind are internet connectivity routers, are large multipurpose routers. When a router is placed at the boundary of an **ISP** and when they communicate with the large autonomous router and external router, it is called edge router When two border gateway protocols speaks to each other via **ASes**, it is called an inter provider border router.

A router that provides sufficient support to the **LAN**, by becoming an integral part of the **LAN** is called core router. Second important kind of routers is **SOHO** routers. When a router is inserted to make connection to a **DSL** or other networks for a small geographical area it is known as **SOHO** connectivity. Third of its types are enterprise routers. Enterprise routers have further three branches access, distribution and core routers. Low cost **SOHO** routers are placed at the branch offices for simple routing operations; they are termed as access routers. Distribution routers collect a flow of data from several routers and bring it to main location. Distribution routers increase the efficiency of large networks such as **WAN**. Core routers are used to connect the dispersed network routers in order to achieve high bandwidth.

(Source: http://freewimaxinfo.com/network-routers.html)

ROUTERS HISTORY

Reading Activity

Read the following text about Routers History and decide whether the following sentences are TRUE or FALSE. Find information in the text to justify your choice.

- IMP stands for International message processor.
- International network Working Group was set up in 1972.
- The first multiprotocol routers were independently created by Virginia Strazisar at BBN in 1981.
- Modern high-speed routers are highly specialized computers with extra software.
- The first Xerox routers became operational in 1991.
- Modern Internet routers that handle both IPv4 and IPv6 are multiprotocol, but are simpler devices than routers processing AppleTalk.
- Major router operating systems, such as those from Juniper Networks and Extreme Networks, are extensively modified versions of Unix software.

The very first device that had fundamentally the same functionality as a router does today, was the Interface Message Processor (IMP); IMPs were the devices that made up the ARPANET, the first packet network. The idea for a router (called "gateways" at the time) initially came about through an international group of computer networking researchers called the International Network Working Group (INWG). Set up in 1972 as an informal group to consider the technical issues involved in connecting different networks, later that year it became a subcommittee of the International Federation for Information Processing.

The idea was explored in more detail, with the intention to produce a prototype system, as part of two contemporaneous programs. One was the initial DARPA-initiated program, which created the TCP/IP architecture in use today. The other was a program at Xerox PARC to explore new networking technologies, which produced the PARC Universal Packet system, due to corporate intellectual property concerns it received little attention outside Xerox for years.

Sometime after early 1974 the first Xerox routers became operational. The first true IP router was developed by Virginia Strazisar at BBN, as part of that DARPA-initiated effort, during 1975-1976. By the end of 1976, three PDP-11-based routers were in service in the experimental prototype Internet. The first multiprotocol routers were independently created by staff researchers at MIT and Stanford in 1981; the Stanford router was done by William Yeager, and the MIT one by Noel Chiappa; both were also based on PDP-11s. Modern Internet routers that handle both IPv4 and IPv6 are multiprotocol, but are simpler devices than routers processing AppleTalk, DECnet, IP, and Xerox protocols.

From the mid-1970s and in the 1980s, general-purpose mini-computers served as routers. Modern high-speed routers are highly specialized computers with extra hardware added to speed both common routing functions, such as packet forwarding, and specialized functions such as IPsec encryption. There is substantial use of Linux and Unix software based machines, running open source routing code, for research and other applications. Cisco's operating system was independently designed. Major router operating systems, such as those from Juniper Networks and Extreme Networks, are extensively modified versions of Unix software.

(Source: http://routers-works.blogspot.com/2007/10/routers-history-very-first-device-that.html)

Telephone Activity

Can you add other expressions to the boxes below?

Stating the reason for a call	Asking for repetition	Ending a call
I'm ringing to ...	*Sorry, I didn't quite catch that.*	*Thanks for your call. Bye now (informal)*

Telephone Activity

Can you add other expressions to the boxes below? Suggested answers

Stating the reason for a call	Asking for repetition	Ending a call
I'm ringing to ... *I'm ringing about ...* *I'm phoning because ...* *I was wondering if you could tell me ...*	*Sorry, I didn't quite catch that.* *Could you repeat that, please?* *Could you speak up a little?*	*Thanks for your call. Bye now. (informal)* *Thank you for your call / Thank you very much.* *Goodbye. (formal)*

Speaking: Pair Work Activity: Using the Telephone

You work in a school as an IT support technician. You want some advice from a specialist about what you should use (bridges or routers) in your school network. You decide to ring IT Maestro, an IT consultancy firm and ask for advice, as you have a contact who works at the firm, John Smith. Read the information below and prepare a telephone dialogue. Remember to use some of the telephone expressions practised in the activities above.

- Your network layout, type and amount of hosts and traffic, and other issues (both technical and non-technical) must be considered.
- Routing would always be preferable to bridging except that routers are slower and usually more expensive (due to the amount of processing required to look inside the physical packet and determine which interface that packet needs to get sent out), and that many applications use non-routable protocols (i.e., NetBIOS, DEC LAT, etc.).
- Rules of thumb: Bridges are usually good choices for small networks with few, if any, slow redundant links between destinations.
- Further, bridges may be your only choice for certain protocols, unless you have the means to encapsulate (tunnel) the unroutable protocol inside a routable protocol.
- Routers are usually much better choices for larger networks; particularly where you want to have a relatively clean WAN backbone.
- Routers are better at protecting against protocol errors (such as broadcast storms) and bandwidth utilization. Since routers look deeper inside the data packet, they can also make forwarding decisions based on the upper-layer protocols.
- Occasionally, a combination of the two devices are the best way to go. Bridges can be used to segment small networks that are geographically close to each other, between each other and the router to the rest of the WAN.

Listening and speaking activity:

Video (http://youtu.be/luOFxh1awiA) (http://youtu.be/-S4yCzP12jA)

Watch the videos on bridges and answer the following questions:

- What are the advantages of bridged network?
- What is a wireless access point?
- What is it used for?
- What does ad-hoc mean?
- Why do you need a bridge
- Which are the two kinds of bridges?

LESSON PLAN WEEK 15/16 TOPIC: ACTIVE COMPONENTS OF THE NETWORK

Learning objectives: By the end of the lesson students will be better able to:

1. **Identify and describe the uses of gateways/network cards**
2. **Use reported speech**
3. **Ask for and give opinions in group discussions**
4. **Listen and identify the key words in a speech**
5. **Take down notes while listening**
6. **Organize ideas to structure a covering letter**
7. **Use discourse markers to structure formal speech and to participate in a debate**

Activity	Differentiation	Interaction	How learning will be checked / assessed
1. **Introduce learning objectives** – explain learning outcomes.	Less independent	T-Ss	
2. **Reading: Gateways** • Group work- students match the words in bold with their meaning (laminated strips of paper) • Teacher elicits the meaning of new words/ students make sentences • Students ask and answer questions about the text	Independent		Vocabulary exercise
3. **Vocabulary: Words with multiple-meanings** • Students make sentences to demonstrate understanding of the different meanings. • Additional words with multiple-meanings. Students either match word to definition and / or use the words in group games.		T-Ss	
4 **Listening & speaking: Video** • Students watch video on Border *Gateway Protocol* and answer the questions.	More independent	Ss-Ss	Matching exercise
5. **Reading / Video: Bill Gates Speech** • Students read about Bill Gates and watch his speech at Harvard. • Students turn into indirect speech some of the quotes of Bill Gates.			Integrated skills
6. **Reading: Network adapters** • Students in pairs read either about Network adapters or Gateways. • Check meaning of unknown words with partner/teacher. • Write 3 questions to ask partner about their reading. • Pairs exchange information.		Ss-Ss Ss-S	Written sentences Monitoring
7. **Listening: Video on DSL Modem and Ethernet card.** • Students listen and complete table with required information.		Ss-Ss	
8. **Case Study: Successful People** • Students match the pictures with the names • Students do research on life of famous people and report back to class • students write a list of tips on how to be successful • Class debate on the advantages & disadvantages of being successful and the role of the individual in society.	More independent		Debate
9. **Writing: A cover letter** • Students write a cover letter for a job.			

HOMEWORK:	Students in groups create scheme of a wireless repeater bridge with security on DDWRT http://youtu.be/N4x3QRaBnS4

GATEWAY

A gateway is a network point that acts as an entrance to another network. On the Internet, a node or stopping point node or a host (end-point) node. Both the computers of Internet users and the computers that serve pages to users are host nodes, while the nodes that connect the networks in between are gateways. For example, the computers that control traffic between company networks or the computers used by internet service providers (ISPs) to connect users to the internet are gateway nodes.

In the network for an enterprise, a computer server acting as a gateway node is often also acting as a proxy server and a firewall server. A gateway is often associated with both a router, which knows where to direct a given packet of data that arrives at the gateway, and a switch, which furnishes the actual path in and out of the gateway for a given packet.

On an IP network, clients should automatically send IP packets with a destination outside a given subnet mask to a network gateway. A subnet mask defines the IP range of a private network. For example, if a private network has a base IP address of 192.168.0.0 and has a subnet mask of 255.255.255.0, then any data going to an IP address outside of 192.168.0.X will be sent to that network's gateway. While forwarding an IP packet to another network, the gateway might or might not perform Network Address Translation.

A gateway is an essential feature of most routers, although other devices (such as any PC or server) can function as a gateway. A gateway may contain devices such as protocol translators, impedance matching devices, rate converters, fault isolators, or signal translators as necessary to provide system interoperability. It also requires the establishment of mutually acceptable administrative procedures between both networks.

Most computer operating systems use the terms described above. Microsoft Windows, however, describes this standard networking feature as Internet Connection Sharing, which acts as a gateway, offering a connection between the Internet and an internal network. Such a system might also act as a DHCP server. Dynamic Host Configuration Protocol (DHCP) is a protocol used by networked devices (clients) to obtain various parameters necessary for the clients to operate in an Internet Protocol (IP) network. By using this protocol, system administration workload greatly decreases, and devices can be added to the network with minimal or no manual configurations.

(Source: http://wiki.answers.com/Q/What_is_a_gateway)

Vocabulary exercise: Words with multiple meanings

In English there are words with multiple meanings. The following are some of them. Make sentences with the different meanings of these words.

host someone who has guests A network host is a computer connected to a computer network

traffic the amount of vehicles moving along roads, or the amount of aircraft, trains or ships moving along a route *Network traffic* or data *traffic* is data in a *network*

firewall a device or program that stops people getting access to a computer without permission while it is connected to the Interne a wall to prevent the spread of a fire

track a route or path between one place and another, or the direction in which something is moving

data track one of the circular magnetic paths on a magnetic disk that serve as a guide for writing and reading data

router a device in a network that handles message transfers between computers. One that routs, especially a machine tool that mills out the surface of metal or wood

Switch a mechanical, electrical, electronic, or optical device for opening or closing a circuit or for diverting energy from one part of a circuit to another. A slender, flexible rod, stick, or twig, especially one used for whipping.

Protocol A standard procedure for regulating data transmission between computers. The forms of ceremony and etiquette observed by diplomats and heads of state.

Configuration Arrangement of parts or elements. The way that the components of a computer network are connected.

Vocabulary Exercise:

1. *Fill in: protocol, rate, signal, computer, impedance, fault, network, internet*
2. Make sentences based on the text using the phrases.

1. .....service providers
2. .....server
3. .....gateway
4. .....translators
5. .....matching devices
6. .....converters
7. .....isolators
8. .....translators

Vocabulary: More words with multiple meanings

Suggestions for use in the classroom:

1. Students are given the words and definitions cut up on laminated cards. In pairs they match the word with the definition.
2. Students then either use dictionaries to find out the non-computer meaning of the words, or they are given the definitions and have to match these to the words.
3. Or the words/definitions could be used as a form of bingo game. Students are given a bingo card with the words on them. The teacher reads out the computer definitions and / or non-computer definitions and the students cross off the words.
4. Or the teacher could put students into small groups and ask them to write down the computer and / or non-computer meaning of the words. The group with the highest number of correct answers is the winner.

Back up (v)	To bring data out of a program in a form suitable for use by another program.
Bit (n)	A common cursor control input device used with a graphical user interface.
Bug (n)	Small unit of storage capacity.
Crash (v)	A connector at the back of a system unit of a PC that is used for connecting external devices to the CPU.
Export (v)	A series of data characters which can be a mixture of letters or numbers.
Hub (n)	To store a copy of data on a storage device to keep it safe.
Menu (n)	To fail suddenly and completely, usually referring to the failure of a hard disk.
Mouse (n)	A fault in a system

Port (n)	A common connection point for devices on a network.
Register (n)	A program written with the purpose of causing damage or causing a computer to behave in an unusual way.
String (n)	A list of options displayed on a computer screen.
Virus	A small unit of very fast memory that is used to store a single piece of data or instruction temporarily that is immediately required by the processor.

Answers – Computer Definitions

Back up (v)	To store a copy of data on a storage device to keep it safe.
Bit (n)	Small unit of storage capacity.
Bug (n)	A fault in a system.
Crash (v)	To fail suddenly and completely, usually referring to the failure of a hard disk.
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String (n)	A series of data characters which can be a mixture of letters or numbers.
Virus	A program written with the purpose of causing damage or causing a computer to behave in an unusual way.

Non-Computer Definitions

Back up (v)	To support or assist.
Bit (n)	A small piece or quantity.
Bug (n)	A small insect.
Crash (v)	To collide or cause (a vehicle) to collide violently with another vehicle.
Export (v)	To send out goods especially for sale in another country.
Hub (n)	The central part of a wheel; the central point of interest / activity.
Menu (n)	A list of dishes available in a restaurant.
Mouse (n)	A small rodent.
Port (n)	A harbour; fortified wine from Portugal; the left-hand side of a ship.
Register (n)	An official list of births, marriages etc; a book in which items are recorded for reference.
String (n)	Twine or narrow cord.
Virus	A small infectious agent that can only replicate inside the cells of another organism. T

BILL GATES

Reading

William Henry Gates, the person who never graduated from a college, is the current chairman and former chief executive of Microsoft. His net worth as on March 2012 was $61 Billion. He founded Microsoft in year 1975 along with his friend Paul Allen.
He was rated as the world's youngest self-made billionaire in year 1987. He was listed in the pages of Forbes' 400 Richest People in America issue when he was 32 years old.

Interesting facts about Bill Gates:

- He is ranked among world's richest people wherein he scored number one in the list from 1995 till 2009, except 2008 wherein he was ranked number three.
- In 1973 he became a student at Harvard University but dropped out in year 1975 wherein he decided to follow his dreams. He had interest in software and programming since early age.
- At the age of thirteen he started writing his own programs and at the age of twenty years he formed Microsoft. He wrote his first program which was tic-tac-toe game that allowed users to play against the computer.
- He created his first venture – Traf-O-Data, at the age 17 with Paul Allen to make traffic counters built on the Intel 8008 processor.
- Bill Gates functioned as a congressional page in the U.S. House of Representatives in year 1973.
- His company became famous for their computer operating systems – MS DOS and later Microsoft Windows. He worked on aggressively broadening the company's product line by holding the position of Product Strategist from Microsoft's founding year 1975 till 2006.

- In year 2000, Bill Gates established Bill & Melinda Gates Foundation along with his wife and has been pursuing number of philanthropic endeavours. His organization has been donating large amounts of money to various charitable organizations and scientific research programs around the world.
- Bill Gates also appeared in a series of ads to promote Microsoft in 2008.

Some cool quotes by Bill Gates:

- "As we look ahead into the next century, leaders will be those who empower others."
- "If you think your teacher is tough, wait until you get a boss. He doesn't have tenure."
- "If you can't make it good, at least make it look good."
- "Life is not fair; get used to it."
- "The Internet is becoming the town square for the global village of tomorrow."
- "Your most unhappy customers are your greatest source of learning."
- "Whether it's Google or Apple or free software, we've got some fantastic competitors and it keeps us on our toes."

(Source: http://www.yesiknowthat.com/bill-gates/)

Listening and Speaking Activity: http://www.youtube.com/watch?v=AP5VIhbJwFs
Listen to Bill Gates Speech at Harvard

What is special about his speech?
In pairs try to turn some of his sentences and quotes into indirect speech.

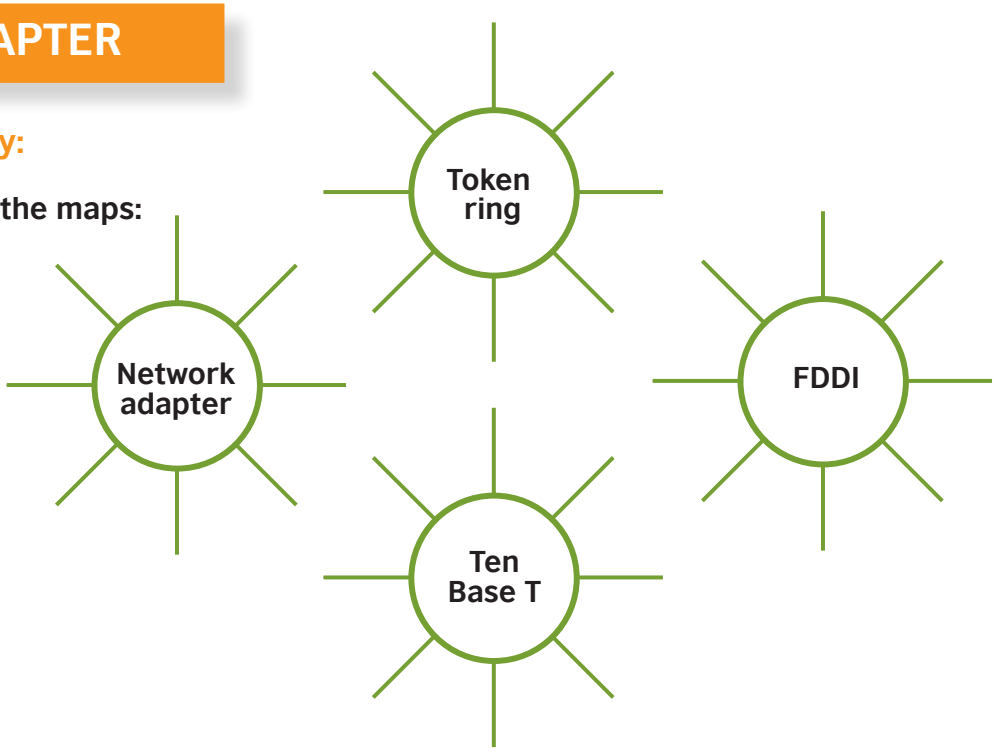
Listening and Speaking Activity: http://youtu.be/R1mGglKlEBY
Watch and listen to the video on Border Gateway Protocol and discuss:

What does EGP refer to?
What is the difference between EGP and BGP

NETWORK ADAPTER

Pre reading activity:

In Groups complete the maps:



A ***network adapter***, also known as a network interface card or NIC, is the device that enables you to send and receive data to and from your computer. This adapter might be integrated into the motherboard or act as a separate device that connects to a PCI slot or USB port. An adapter can connect to the network by cable (wired) or by air (wireless). Network adapters also have a software component known as a driver; this usually includes a properties page that can be accessed in the operating system.

The network controller implements the electronic circuitry required to communicate using a specific physical layer and data link layer standard such as Ethernet, Wi-Fi or Token Ring. This provides a base for a full network protocol stack, allowing communication among small groups of computers on the same LAN and large-scale network communications through routable protocols, such as IP.

Every Ethernet network controller has a unique 48-bit serial number called a MAC address, which is stored in read-only memory. Every computer on an Ethernet network must have at least one controller.

Definition and Purpose

- Network adapters are cards that are installed in a host computer to allow the host to be connected to a local area network (LAN). Although some hosts have the network cards built in, many computers use removable cards that can be replaced if the networking needs of the host change. These changes could include a requirement for the ability to transfer more data faster, also known as increasing bandwidth.

Token Ring

- One of the original network configurations and protocols was called token ring. Token ring was a proprietary protocol developed by IBM. Token ring adapters, or interface cards, allowed computers to be connected in a ring configuration, where data had two paths to reach its eventual destination. Although token ring networks, and, as such, token ring network adapters are rarely used, a few manufacturers are still making adapters that

are certified to work with current versions of Windows. 5-Base T

The Ethernet standard was initially developed in 1973. The original protocol was capable of transmitting a paragraph of text over a thick, coaxial cable over a distance of about 1,000 meters. Although the speed was slow by modern standards, this original configuration eventually resulted in a five megabit per second (mbps) network protocol that ran over coaxial cable. This networking standard was called 5-base T.

10-Base T

- Limitations in the ability of coaxial cable to carry data over its single core triggered the creation of a new networking standard in 1987 called 10-base T. 10-base T transmitted data over twisted pairs of telephone cables, using the twists to minimize interference and cross-talk. By using multiple wire pairs, the standard was able to transmit data at much higher data rates than was possible with coaxial cable. 10-base T network adapters were common in the 1990s.

100-Base T

- 100-base T network adapters took advantage of advances in network cabling technology that allowed much faster data transfer speeds over twisted pairs of wire designed for very low interference and cross-talk. 100-base T is also known as "fast Ethernet."

Gigabit Ethernet

- Modern data communication, especially between servers, has pushed bandwidth requirements much higher. In the late 1990s, a new protocol called "gigabit Ethernet" was introduced. With the installation of a gigabit Ethernet card, sometimes called 1000-base T or other permutations of the 1000-base name schema, computers increase available networking bandwidth 10 times. Gigabit Ethernet is capable of transmitting 1,000 mbps of data over standard networking cables.

FDDI

- Ethernet and token ring networks have distance limitations on cables. In cases where data needs to be sent over a long distance, in some cases miles, a fiber data digital interface (FDDI) adapter can be installed in a computer. An FDDI adapter converts data to optical pulses and transmits them over fiber optic lines. FDDI is a 100 mbps distributed network that uses a token ring-type architecture. FDDI frames can easily re-encapsulate Ethernet data for retransmission over great distances.

(Source: http://www.ehow.com/about_5250468_history-network-interface-card.html)

Reading exercise: Highlighting important information

In pairs, *A* read the text about Gateways and *B* read about Network adapters.
As you read, highlight anything that is interesting or important.
Choose five words you do not know. Can you guess the meaning from the context? Check it with your partner/teacher.
Write three questions to ask your partner about the other text.

Listening Activity: Video

http://youtu.be/1WxZ2Zk3v5Y
http://youtu.be/1WxZ2Zk3v5Y

- Watch the videos and listen to the specialist explaining what a DSL Modem and an Ethernet Card is.
- While listening fill in the table with the right information.

DSL Modem	Ethernet Card

SUCCESSFUL PEOPLE - (STEVE JOBS)

1) Match the names with the pictures

Bill Gates

Alexander Graham Bell

Steve Jobs

Cees Links

2) What are these people famous for?

3) What do they have in common?

Steven Paul Steve Jobs also known as Jobs or Steve Jobs was a very successful businessman born on February 24, 1955 and died on October 5, 2011.

His popularity is mainly connected with his business as being the Founder and CEO of Apple but he had such charismatic personality that took a street guy from a garage into an office that was considered to be one of the most influential, powerful and successful business in history. His death left a lot of people in agony and pain and a lot of people became curious to know about Steve's background, where he came from, how he was brought up and other personal things that he was associated with.

Steve Jobs was always described as an innovator, a visionary; and rightly so. He dropped out of college at the age of 21 and started Apple with his friend Steve Wozniak from his parents' garage. Apple's first product was not a runaway success but Apple II helped the company in getting noticed. Steve Jobs became a multimillionaire by the time he turned 25. He also graced the cover of Time magazine at 26.

In a surprise turn of events, Steve Jobs was ousted from Apple in 1984 when he was 30. He did not waste too much time sulking about being unemployed and went on to establish NeXT computers. In 1986, Steve Jobs bought the computer graphics arm of Lucas film, Ltd., and this company is known today as Pixar Animation Studios.

In the meantime, Apple struggled to keep pace with the changing times and decided to bring back Jobs in 1996 by buying NeXT. Steve Jobs returned as the CEO of Apple in 1997 and took the company to unprecedented heights. Over the years, many people have looked up to Steve Jobs as a source of inspiration.

The ten best inspirational quotes by the man himself.

1. At an Apple product event for the first Macintosh computer on January 24, 1984: "We're gambling on our vision, and we would rather do that than make "me, too" products. Let some other companies do that. For us, it's always the next dream."

2. In Playboy magazine in February 1985: "If you want to live your life in a creative way, as an artist, you have to not look back too much. You have to be willing to take whatever you've done and whoever you were and throw them away."

3. At the Apple Worldwide Developers Conference, May 1997: "I'm actually as proud of the things we haven't done as the things I have done. Innovation is saying no to 1,000 things."

4. Talking about work at the Stanford University's Commencement address on June 12, 2005: "Your work is going to fill a large part of your life, and the only way to be truly satisfied is to do what you believe is great work. And the only way to do great work is to love what you do. If you haven't found it yet, keep looking. Don't settle."

5. Talking about him being fired from Apple at the Stanford University's Commencement Speech 2005: "I didn't see it then, but it turned out that getting fired from Apple was the best thing that could have ever happened to me. The heaviness of being successful was replaced by the lightness of being a beginner again, less sure about everything. It freed me to enter one of the most creative periods of my life.[...] It was awful tasting medicine, but I guess the patient needed it. Sometimes life hits you in the head with a brick. Don't lose faith."

6. Steve Jobs gave an interview in "60 minutes" in 2003 in which he shared that his business model was inspired by The Beatles: "My model for business is The Beatles: They were four guys that kept each other's negative tendencies in check; they balanced each other. And the total was greater than the sum of the parts. Great things in business are not done by one person, they are done by a team of people."

7. In an interview to Business Week in 1998: "That's been one of my mantras - focus and simplicity. Simple can be harder than complex: You have to work hard to get your thinking clean to make it simple. But it's worth it in the end, because once you get there, you can move mountains."

8. In a statement to The New York Times, 2003: "[Design is] not just what it looks like and feels like. Design is how it works."

9. On being the richest man in an interview to The Wall Street Journal in 1993 "Being the richest man in the cemetery doesn't matter to me... Going to bed at night saying we've done something wonderful... that's what matters to me."

10. Talking about Death at the Stanford University commencement speech, June 2005: "Remembering that I'll be dead soon is the most important tool I've ever encountered to help me make the big choices in life. Because almost everything -- all external expectations, all pride, all fear of embarrassment or failure -- these things just fall away in the face of death, leaving only what is truly important. Remembering that you are going to die is the best way I know to avoid the trap of thinking you have something to lose. You are already naked. There is no reason not to follow your heart. ... Stay hungry. Stay foolish."

(Source: http://www.yesiknowthat.com/6-personal-things-you-didnt-know-steve-jobs)

Listening and Speaking activity:

http://www.youtube.com/watch?v=KuNQgIn6TL0

Listen to Steve Jobs on his rules for success.

Discuss in groups and then make your list on ten rules on how to become successful.

Debate

The advantages and disadvantages of being successful.

The role of individual in society.

To encourage students to use appropriate language, each student could be given several cards with themed key vocabulary. The students have to use the language on their cards during the debate.

Examples of key vocabulary (taken form B2 language descriptors)

I totally agree (expressing agreement)	That's a good point (expressing agreement)	No, I'm afraid I can't agree with you there. (expressing disagreement)
To begin with ... (developing an argument)	As far as I am concerned ... (developing an argument)	The way I see it ... (developing an argument)
Are you following me? (discourse function – checking understanding)	Let me know if you have any questions (discourse function – checking understanding)	Let me see whether I've understood you correctly ... (discourse function – checking understanding)
So what you're really saying is (discourse function – checking understanding)	Am I right in assuming ... (discourse function – checking understanding)	Furthermore (discourse marker to structure formal speech)
Moreover (discourse marker to structure formal speech)	Consequently (discourse marker to structure formal speech)	Regarding (discourse marker to structure formal speech)

WRITING A COVER LETTER

Writing Activity
You are going to apply for a job you think is the proper one for you. You have written your CV and you also need to write a cover letter.
Write a cover letter.

Here are some tips

What's a Cover Letter?
A cover letter is a written way of introducing yourself. It usually accompanies a resume or another kind of business letter.

Writing a Cover Letter
Cover letters are easy to write if we think of them as being in three parts. There's an opening section, a middle section, and a closing section. Before we get into these sections, however, make sure that you include your name, address and date at the top of the letter, and underneath that, include the recipient's name, business name, address before a salutation, such as "Greetings Mr. Smith."

Introduction of a Cover Letter
In the opening section of the letter, you want to get the reader's attention, as well as just telling the main purpose of your letter. If you're looking for a job opening, you may want to inquire if that job opening is open in your field - or if it will become available in the future. If you already know about a specific job opening, mention that instead.

Middle of a Cover Letter
The middle section of a cover letter is the main part of your letter. If you're writing to inquire about a job opening and would like an interview, you want to give your reader as many reasons as possible to bring you in for that interview. This includes any relevant information like education, past job experience, and special achievements that would really make the recipient of that letter want to bring you in for an interview.

Closing Paragraph of a Cover Letter
Okay, so you've stated your purpose for the letter. Now it's time to move onto the closing paragraph. This isn't just to summarize your letter, however; really, the closing paragraph can help you secure your desired outcome. Be sure to include very important information such as an e-mail address and cell phone number, so your potential employer can contact you easily.

Extra Tips for Writing a Cover Letter
A couple of extra tips: be sure that when you're writing a cover letter, that you write to someone specifically. For example, if you're inquiring about a job interview, write to the person directly in charge of hiring. Also, always make sure to sign your letter. It looks very unprofessional if you don't.

(Source: http://www.bbc.co.uk/worldservice/learningenglish/business/getthatjob/unit3coverletter/page1.shtml)

WEEK 17-18 ASSESSMENT: TEST 1 (WEEKS 1-4)

I. What do these acronyms stand for: (10 points/___)

1. ADSL
2. SMS
3. ISP
4. RFID
5. WAN
6. GIF
7. IP
8. LAN
9. JPEG
10. ICT

II. Write LAN or WAN :(10 points /_____)

A school network _____
A bank network _____
A building _____
Internet _____

III. Complete the gaps in the text with a suitable word: (10 points/_____)

Hardware software data e-mail

A computer network is a number of computers linked together to allow them to share resources. Networked computers can share _____, _____ and _____.
Most computer networks have at least one server. A server is a powerful computer that provides one or more services to a network and its users. For example, file storage and _____.

IV. Write plural forms of these nouns:(10 points /__)

File
Datum
Software
Virus
Network
e-mail
hardware
device
capability
attachment
criterion

V .Correct the following statements:(10 Points /_____)

1.Routers are used to link two computers.
2.Wireless WAN`S use fibre and cable as well as linking devices.
3.In a client-server architecture all the workstations have the same capabilities .
4.Hotspots can only be found inside a building.
5.The internet is an example of a LAN.

Exercise 1	Exercise 2	Exercise 3	Exercise 4	Exercise 5	Total
10 points	10 points	10 points	10 points	10 points	50 points

ASSESSMENT: TEST 2 (WEEKS 5-8)

EXERCISE 1: Complete each gap in this text with a suitable word from the list.

Influenced	credited	prosperous	bridge	submitted	Topology	regard	resides
field	discover	Document	inspired	crossed	location	solution	

Throughout its history, many mathematicians have 1)..... the development of topology. While Johann Benedict Listing is not credited with a memorable discovery in terms of the field of 2)....., he is still considered one of the founding fathers. This is because he gave topology its name. While he published very little on topology, he is remembered for *Vorstudien zur Topologie*, which was the first 3)..... to use the word topologie (English: topology) to describe the field. He is also often 3)..... with discovering the Möbius strip independently of August Ferdinand Möbius

The origins of topology date back to the eighteenth century and the *Königsberg Bridge Problem*, a problem of relative position without 4)..... to distance . While this 5) is often regarded as the birth of graph theory, it also 6)..... Euler's development of the topology of networks Königsberg, now Kaliningrad, was founded in 1255 and became a 7)..... seaport . The city 8)..... on the banks of the Praegel, now Pregolya, River. Citizens could use seven bridges that 9)..... the Praegal, but the question of whether or not one could pass through the town and use each 10)..... exactly once would turn out to be the catalyst in the creation of the mathematical 11)..... of topology. Swiss mathematician Leonhard Euler would be the one to 12)..... the answer was no. He determined that the graph defined by the 13)..... of the bridge was not what is now called a Eulerian graph This14)..... entitled *The Solution of a Problem Related to the Geometry of Position* was 15)..... to the Academy of Sciences in St. Petersburg in 1735 .

EXERCISE 2: Identify these items:

1) Can control the starting and stopping of documents printing as well as concepts of documents such as spooling ,printer pooling and much more.
2) It can house a relational database made up of one or more files.
3) It includes not just emails server ,but also fax ,instant massaging etc.
4) It consist of a main run of cable with a terminator at each end.
5) It reduces the chances of network failure by connecting all of the system to a central node.
6) It arranges links and node into distinct hierarchies in order to allow greater control and easier troubleshooting .
7) All messages travel through it in the same direction.
8) Star –Ring and Star – Bus network are most common examples of this network.
9) Its function is to hold data read or written to it by the processor.
10) Its function is to control all the operations in a computer.

EXERCISE 3: Fill in the blanks with the correct form of **can** or **be able to**.

1)Laser light .....travel faster than an electric current.
2)In the future ,domestic appliances .....report any breakdowns for repair.
3)Marconi .....send a radio signal across the Atlantic.

4)Professor Warwick had a chip fitted into his arm which.....open doors and switch on computers as he approached.
5)Imagine .....to access the internet from a kitchen appliance.
6)Star and Ring topologies .....be used effectively in hybrid topology.

EXERCISE 4: Complete the sentences.(indirect questions)
1) Why can Hybrid Topology be reliable?—I have no idea.....
2) Which company should practice this kind of network? To tell the truth ,I haven't I haven't found out.....
3) How much does the infrastructure of this network cost?----Why do you want to know .....
4) Why is this topology effective?---- I wonder why.....
5) Is this the right topology to be used ?----Let's ask someone.....
6) Is it all right to use this network in our company?------I do not know .....

Table of points for each exercise:

Ex1	Ex2	Ex3	Ex4	Total
30	10	5	5	40

Mark	4	5	6	7	8	9	10
points	0-10	11-16	17-22	23-28	29-33	34-37	38-40

ASSESSMENT: TEST 3 (WEEKS 9-12)

I. Identify these items: (7 points/_____)

1. Its function is to connect separate homogeneous networks. _____
2. It is a hardware component used to connect two or more network segments (LANs or parts of a LAN) which are physically and logically separated. _____
3. It acts as an entrance to another network. _____
4. Its function is to send and receive data to and from your computer._____
5. It is a powerful network device which is used to regenerate the signals, when they travel over a longer distance, so that the strength of the signal remains the same._____
6. It collects a flow of data from several routers and brings it to main location._____
7. Its function is for regulating data transmission between computers._____

II. Mach the adjectives in column A with the nouns in column B and then make sentences with these combinations.(10 points/_____)

A	B
Visionary	LAN
commercial	cable
broadband	leader
Plastic	technology
Bus	use
Wireless	signals
Signal	network
electronic	services
nanostructure	cover
Coaxial	interference

III. What do these acronyms stand for: (10 points/_____)

1. LAN
2. ISO
3. IP
4. DSL
5. ATM
6. LCD
7. TIA
8. UTP
9. EIA
10. STP

IV. Write the noun for the following verbs in Table A and the adjectives for the nouns in Table B. (20 points/_____)

A

Verb	Noun
Inform	
Develop	
Apply	
Distribute	
Compete	
Interfere	
Vary	
Install	
Transmit	
Associate	

B

Noun	Adjective
Wire	
Success	
Twist	
Environment	
Mountain	
Line	
Advantage	
Metropolis	
Electric	
addition	

V. Convert these simple rules for running cables into a description in the Present Passive. (8 points/_____)

For example:

Use wire tacks or clips to anchor individual wires to the back of your cabinet.
Wire tacks or clips are used to anchor individual wires to the back of your cabinet.

1. Use Crutchfield's CableLabels™ to clearly identify your cables.
2. Always use more cable than you need.
3. Leave plenty of slack.
4. Test every part of a network as you install it.
5. If it is necessary to run cable across the floor, cover the cable with cable protectors.
6. Label both ends of each cable.
7. Use cable ties (not tape) to keep cables in the same location together.
8. Keep excess cabling in an "S" or figure-eight shape (not in a loop) to prevent electromagnetic interference.

VI. Complete the gaps in the text with a suitable word (15 points/_____)

Cabling layer interference thick conductor
transmission networks route repeater computer
invented long shield moisture used

Coaxial cable was (1) _____ in 1929 and first (2) _____ commercially in 1941. AT&T established its first cross-continental coaxial (3) _____ system in 1940. Coaxial cables are

installed in underground ducts in metropolitan areas. However, in country areas, and over (4) _____ -distance routes, the cable is buried about a meter deep along its (5) _____. Rather larger excavations have to be made for the underground housings for the (6) _____ equipment, into which the cable is led and jointed. Coaxial cables were extensively used in mainframe (7)_____systems and were the first type of major cable used for LAN.
Coaxial (8) _____ has a single copper conductor at its center. A plastic (9) _____ provides insulation between the center conductor and a braided metal shield. The metal (10) _____ helps to block any (11) _____ outside from fluorescent lights, motors, and other computers. Two types of coaxial cabling are: (12)_____ coaxial and thin coaxial. Thin coaxial cable has been popular in school networks, especially linear bus (13)_____. Thick coaxial cable is also referred to as thicket. Thick coaxial cable has an extra protective plastic cover that helps keep (14)_____ away from the center (15) _____.

VII. Put the verbs in the proper form: (4 points/_____)

If I _____ (know) how to do it, I would do it myself.
If I _____ (be) you, I _____ (check) the cables first.
If they _____ (ask) me , I would tell them to use a fiber optic cable.

VIII. Finish the second sentence using conditionals: (6 points/_____)

It is a shame that you did not use the right equipment.
If I _____
You should use routers in this situation.
If I _____
She isn`t a reliable worker, so she didn`t get a promotion.
If she _____
I arrived late because my alarm clock didn`t go off.
If _____

Mark	4	5	6	7	8	9	10
points	19	20-31	32-43	44-55	56-66	67-75	76-80

ExI	ExII	ExIII	ExIV	ExV	ExVI	ExVII	ExVIII	Total
7	10	10	20	8	15	4	6	80

SUMMATIVE ASSESSMENT: FINAL TEST

English in Use

Section A

Read the following text. For each space (numbers 1-10) use the correct form of the word in the right hand column.

What Makes a Strong Password?	
Two of the most *(1)*..... used passwords are '123456' and 'password' - very bad choices as they would be among the first to be tried by an intelligent *(2)*..... .	**(1) common** **(2) attack**
The ideal password is a fairly random sequence of characters, and extra length is usually more important than a wider range of symbols. But creating your password in this way is not always the most 'human-friendly' approach as you may find it *(3)*..... to remember.	**(3) trick**
Instead, one of the best techniques is to choose a *(4)*..... phrase containing the same number of words as the desired password length in letters (usually this is at least eight characters) and use the first letter of each word to create an acronym to use as your password. The *(5)*..... phrase should not be well-known, and using capitals and lower case can add quite a lot of strength, but substituting numbers for letters or adding special symbols doesn't make much *(6)*.....	**(4) memory** **(5) choose** **(6) different**
There are many websites that will allow you the chance to see how *(7)*..... your password is, and often the site you are registering with will offer you the chance to test the *(8)*..... of your proposed password before you log on.	**(7) security** **(8) strong**
The Password Meter will allow you to test the strength of your chosen password and experiment with how it can be improved by adding upper and lower case letters as well as numbers and symbols. Password Calculator is another useful *(9)*..... of password strength. This intriguing site will show you how *(10)*..... your password could be hacked using a 'brute force' attack. By playing around with various characters and password lengths it's not hard to create a password that could take many thousands of years to crack!	**(9) indicate** **(10) quick**

Adapted from: *http://www.bbc.co.uk/webwise/guides/choosing-a-password - accessed on 13/03/13*

Section B

Questions 1-10: Complete the second sentence so that it has a similar meaning to the first sentence. You must use the work in **bold**.

1. What are you using this machine for?

   is

   What ……used for?

2. I advise you to contact your internet service provider.

   suggest

   I……your internet service provider.

3. Tom and David from the IT department have disabled the firewall.

   by

   The firewall…… from the IT department.

4. If we continued to sell more PCs, we'd have to employ more staff.

   reduce

   We'd have to …… we continued to sell more PCs.

5. 'Do you know how to set up the new network, Aleksander?' asked Ermir.

   if

   Ermir asked Aleksander…… new network.

6. Where are the instructions for this new printer?

   tell

   'Could you …… ?'

7. The new internet connection is really quick compared to before

   far

The new internet connection……..before.

8. I think you should try ordering the fibre optic cable from a different supplier.

   were

   If I …… ordering the fibre optic cable from a different supplier.

9. This is the quickest processor I've ever used.

   as

   I've never…… before.

10. Although the printers were expensive, the quality was excellent.

    despite

    ……, the quality of the printers was excellent.

Section C

Read the following text. For numbers 1-10 complete each space with **one** word only.

Network topology is the layout pattern of interconnections of the various elements (links, nodes, etc.) of a computer network. Network topologies may *(1)*…… physical or logical. Physical topology means the physical design of a network including the devices, location and cable installation. Logical topology refers *(2)*…… how data is actually transferred in a network as opposed *(3)*…… its physical design.

Topology can be considered as a virtual shape or structure of a network. This shape does not correspond *(4)*…… the actual physical design of the devices on the computer network. The computers on a home network can be arranged *(5)*…… a circle but it does not necessarily mean that it represents a ring topology.

Any particular network topology *(6)*…… determined only by the graphical mapping of the configuration of physical and/or logical connections between nodes. The study *(7)*…… network topology uses graph theory. Distances between nodes, physical interconnections, transmission rates, and/or signal types may differ in two networks and yet their topologies may be identical.

A local area network (LAN) is one example of a network *(8)*…… exhibits *(9)*…… a physical topology and a logical topology. Any given node in the LAN has one or more links to one or more nodes in the network and the mapping of these links and nodes in a graph results *(10)*…… a geometric shape that may be used to describe the physical topology of the network. Likewise, the mapping of the data flow between the nodes in the network determines the logical topology of the network. The physical and logical topologies may or may not be identical in any particular network.

(Source: http://www.princeton.edu/~achaney/tmve/wiki100k/docs/Network_topology.html - accessed on 13/03/13)

Section D

Read the following text. For questions 1-10 choose one word from the box below which is most suitable for each space. Put a circle around the correct word in each box.

Case study 1

Home worker's connection problems

Peter *(1)*..... a small website design company from a home office, and assumed he *(2)*..... be fine with home broadband instead of a business broadband package. The *(3)*..... of his business involved working locally on his own.

After *(4)*..... in business for a few months he lost his Internet connection. After repeated calls over several days, Peter was still offline. The customer service *(5)*..... been outsourced to an overseas call centre and communication was strained at *(6)*.....

Consumer broadband carried no guarantees should a problem *(7)*..... Providers are within their rights (as set out in your contract with them) to fix any problems within an acceptable time period; this could be anything from a day to several weeks.

How business broadband would have helped:

Peter's broadband connection was finally repaired after 14 days. If Peter had taken a business broadband package, he could have saved time and money, *(8)*..... is essential to any small business.

Most business broadband providers operate from call centres, which could've helped Peter *(9)*..... his problem more *(10)*..... and more efficiently.

1)	does	runs	made	wants
2)	might	should	will	would
3)	most	main	major	majority
4)	being	been	be	gone
5)	had	has	have	will
6)	good	best	better	well
7)	arise	rise	happen	come
8)	what	that	which	where
9)	communicate	communicating	communicated	communication
10)	easiest	easy	easier	easily

(Source: http://www.cable.co.uk/guides/business-broadband/ - accessed on 13/03/13

English in Use - Key

Section A

What Makes a Strong Password?	
Two of the most **commonly** used passwords are '123456' and 'password' - very bad choices as they would be among the first to be tried by an intelligent **attacker**.	**common** **attack**
The ideal password is a fairly random sequence of characters, and extra length is usually more important than a wider range of symbols. But creating your password in this way is not always the most 'human-friendly' approach as you may find it **tricky** to remember.	**trick**
Instead, one of the best techniques is to choose a **memorable** phrase containing the same number of words as the desired password length in letters (usually this is at least eight characters) and use the first letter of each word to create an acronym to use as your password. The **chosen** phrase should not be well-known, and using capitals and lower case can add quite a lot of strength, but substituting numbers for letters or adding special symbols doesn't make much **difference**.	**memory** **choose** **different**
There are many websites that will allow you the chance to see how **secure** your password is, and often the site you are registering with will offer you the chance to test the **strength** of your proposed password before you log on.	**security** **strong**
The Password Meter will allow you to test the strength of your chosen password and experiment with how it can be improved by adding upper and lower case letters as well as numbers and symbols. Password Calculator is another useful **indicator** of password strength. This intriguing site will show you how **quickly** your password could be hacked using a 'brute force' attack. By playing around with various characters and password lengths it's not hard to create a password that could take many thousands of years to crack!	**indicate** **quick**

Section B

1. What are you using this machine for?

   is

   What is this machine being used for?

2. I advise you to contact your internet service provider.

   suggest

   I suggest contacting/ suggest that you contact your internet service provider.

3. Tom and David from the IT department have disabled the firewall.

   by

   The firewall has been disabled by Tom and David from the IT department.

4. If we continued to sell more PCs, we'd have to employ more staff.

   Reduce

   We'd have to reduce our staff unless we continued to sell more PCs.

5. 'Do you know how to set up the new network, Aleksander?' asked Ermir.

   if

   Ermir asked Aleksander if he knew how to set up the new network.

6. Where are the instructions for this new printer?

   tell

   'Could you tell me where the instructions for this new printer are?'

7. The new internet connection is really quick compared to before

   far

   The new internet connection is far quicker than before.

8. I think you should try ordering the fibre optic cable from a different supplier.

   were

   If I were you I'd try ordering the fibre optic cable from a different supplier.

9. This is the quickest processor I've ever used.

   as

   I've never used a processor as quick as this before.

10. Although the printers were expensive, the quality was excellent.

    despite

    Despite being expensive, the quality of the printers was excellent.

Section C

Read the following text. For numbers 1-10 complete each space with **one** word only.

Network topology is the layout pattern of interconnections of the various elements (links, nodes, etc.) of a computer network. Network topologies may **be** physical or logical. Physical topology means the physical design of a network including the devices, location and cable installation. Logical topology refers **to** how data is actually transferred in a network as opposed **to** its physical design.

Topology can be considered as a virtual shape or structure of a network. This shape does not correspond **to** the actual physical design of the devices on the computer network. The computers on a home network can be arranged **in** a circle but it does not necessarily mean that it represents a ring topology.

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A local area network (LAN) is one example of a network **that** exhibits **both** a physical topology and a logical topology. Any given node in the LAN has one or more links to one or more nodes in the network and the mapping of these links and nodes in a graph results **in** a geometric shape that may be used to describe the physical topology of the network. Likewise, the mapping of the data flow between the nodes in the network determines the logical topology of the network. The physical and logical topologies may or may not be identical in any particular network.

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Section D

Case study 1

Home worker's connection problems

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How business broadband would have helped

Peter's broadband connection was finally repaired after 14 days. If Peter had taken a business broadband package, he could have saved time and money, *(8)*..... is essential to any small business.

Most business broadband providers operate from call centres, which could have helped Peter *(9)*..... his problem more *(10)*.....

1)	does	**runs**	made	wants
2)	might	should	will	**would**
3)	most	main	major	**majority**
4)	**being**	been	be	gone
5)	**had**	has	have	will
6)	good	**best**	better	well
7)	**arise**	rise	happen	come
8)	what	that	**which**	where
9)	**communicate**	communicating	communicated	communication
10)	easiest	easy	easier	**easily**

(Source: http://www.cable.co.uk/guides/business-broadband/ - accessed on 13/03/13)

Task 3 Matching headings

The article has seven sections, A-G.

Choose the correct heading for each section from the list below. One has been done as an example. Please note that there are more headings than sections.

Write the correct numbers i-x in boxes A-G.

A	B	C	D	E	F	G

List of headings

i. Is any of this good for our attention spans?
ii. In which workplaces?
iii. When will email finally die out?
iv. Is the decline a new phenomenon?
v. Why are social networks so popular?
vi. What are the advantages of email?
vii. So what is the alternative?
viii. Why is the company giving up email?
ix. So email still has its uses?

Task 4 Multiple-choice questions

Choose the appropriate letters A, B, C or D. Write your answers in boxes 1-5 below.

1. Email use is decreasing fastest between
   A. teenagers
   B. people at work
   C. 25-35 year olds
   D. middle-aged people.

2. The major problem with email at work is that
   A. there is too much spam
   B. it is not environmentally friendly
   C. it wastes people's time
   D. it is considered old-fashioned.

3. 'IM' is popular
   A. when people are playing games
   B. because it is more instant
   C. because it is used on Facebook
   D. because it is like a phone call.

4. Electronic communication
   A. is thought to be addictive
   B. can make people take drugs
   C. makes people less productive
   D. helps us concentrate better.

5. Email is
   A. not as popular as social networking these days
   B. not as compatible as other forms of electronic communication
   C. still a monopoly
   D. still the most popular form of electronic communication.

1	2	3	4	5

Task 5 Matching features

Match the point of view below (1-3) with the person who said it (A-C). Write the correct letters in the boxes.

1. Mark Zuckerburg ☐
2. Thierry Breton ☐
3. Nora Volkow ☐

A. There are too many emails to manage these days.
B. Advances in technology are changing how we think.
C. Teenagers don't use email these days.

Task 6 Yes / No / Not given

Do the statements below reflect the information given in the article?

In the boxes, write:

YES	if the statement reflects the information
NO	if the statement contradicts the information
NOT GIVEN	if there is no information about this.

1.	Many companies are not using email anymore.	
2.	Atos Origin isn't using email at all these days.	
3.	Not all emails contain useful information.	
4.	'IM' helps to save memory space on computers.	
5.	'Status updates' often contain irrelevant information.	
6.	Research clearly shows electronic communication makes us less productive.	