

<b>Paper 1. Theory fundamentals</b>	<b>90 minutes</b>
Written paper. Learners answer a range of between nine and fifteen compulsory short-answer and structured questions for 70 marks. These questions assess the learner's knowledge, understanding (AO1), analysis and application (AO2).	
70 marks - 35% of total marks	
<b>Paper 2. Solution design</b>	<b>90 minutes</b>
Written paper. Learners answer a range of between nine and fifteen compulsory short-answer and structured questions for 70 marks. These questions assess the learner's knowledge, understanding (AO1), application, analysis (AO2) and practical skills (AO3).	
70 marks - 35% of total marks	
<b>Paper 3. Problem-solving and programming skills</b>	<b>120 minutes</b>
Written paper. Learners will need to write answers in a programming language or pseudocode. These questions assess the learner's knowledge, understanding (AO1), application, analysis (AO2) and practical skills (AO3).	
60 marks - 30% of total marks	

## Содержание компонентов тестовой спецификации 12 класса

№	Strand	Sub-strand	Paper 1	Paper 2	Paper 3
1	Data and information	1.1 Data representation	✓		
		1.2 Information security	✓		
		1.3 Ethics and ownership	✓		
2	Problem solving	2.1 System life cycle		✓	
		2.2 Engineering		✓	
3	Computer systems	3.1 Software	✓		
		3.2 CPU	✓		
		3.3 Boolean logic		✓	
		3.4 Memory	✓		
4	Information systems	4.1 Databases		✓	
		4.2 SQL query language		✓	
		4.3 Artificial intelligence	✓		
5	Programming	5.1 Programming paradigms	✓*		✓**
		5.2 Algorithms and data structure			✓
		5.3 Programming and testing the system			✓
		5.4 Mobile applications development			✓
6	Communication and networks	6.1 Computer networks	✓		
		6.2 Principles of Internet operation	✓		
		6.3 Protocols	✓		

Term 1	Term 2	Term 3	Term 4
<b>11.1A Computer systems</b> <ul style="list-style-type: none"> <li>Software categories</li> <li>Operational systems</li> <li>Von Neumann architecture</li> <li>Memory types</li> <li>Boolean logic</li> </ul>	<b>11.2A Information systems</b> <ul style="list-style-type: none"> <li>Database basics</li> <li>Normalization</li> <li>Entity Relationship diagrams</li> <li>SQL</li> </ul>	<b>11.3A Algorithms and data structure</b> <ul style="list-style-type: none"> <li>Structure of one-dimensional and two-dimensional arrays</li> <li>Search and sort algorithms</li> <li>Efficiency of algorithms</li> </ul>	<b>11.4A Programming system</b> <ul style="list-style-type: none"> <li>Project development</li> </ul>
<b>11.1B Programming paradigms</b> <ul style="list-style-type: none"> <li>Classification and categories of programming languages</li> <li>Translators</li> </ul>	<b>11.2B Designing a new system</b> <ul style="list-style-type: none"> <li>Data flow diagram</li> <li>Flowcharts</li> <li>Prototyping</li> <li>Advantages and restrictions of system</li> <li>Development environment</li> <li>Technical specification</li> </ul>	<b>11.3B Web programming</b> <ul style="list-style-type: none"> <li>HTML markup language</li> <li>CSS stylesheet</li> <li>Script language</li> <li>Using scripts to create site content</li> </ul>	<b>11.4B Information security</b> <ul style="list-style-type: none"> <li>Security, privacy and data integrity</li> <li>Safety device</li> <li>Validation and verification</li> <li>Blockchain technology</li> <li>Ethics and ownership</li> </ul>
<b>11.1C System lifecycle</b> <ul style="list-style-type: none"> <li>System lifecycle stages</li> <li>System lifecycle model</li> <li>Dataflow diagrams</li> <li>Flowcharts</li> </ul>		<b>11.3C Mobile applications development</b> <ul style="list-style-type: none"> <li>Application interface</li> <li>Mobile application development</li> <li>Publishing mobile application</li> </ul>	<b>11.4C Communication and networks</b> <ul style="list-style-type: none"> <li>Computer networks</li> <li>Principles of Internet operation</li> <li>Protocols</li> </ul>





## Learning objectives

11.3.1.1 justify the choice of applied software and choice criteria based on the goals (обосновывать выбор прикладного программного обеспечения и критериев выбора для конкретных целей)

11.3.1.2 classify application software (классифицировать прикладное программное обеспечение)

# Vocabulary

ENGLISH	РУССКИЙ
Software	Программное обеспечение
System software	Системное ПО
Application software	Прикладное ПО
General purpose software	ПО общего назначения
Specific purpose software	ПО специального назначения
Bespoke software	ПО на заказ
Utility	Утилита
Library programs	Библиотеки программ
Translator	Транслятор
Hardware	Аппаратное обеспечение

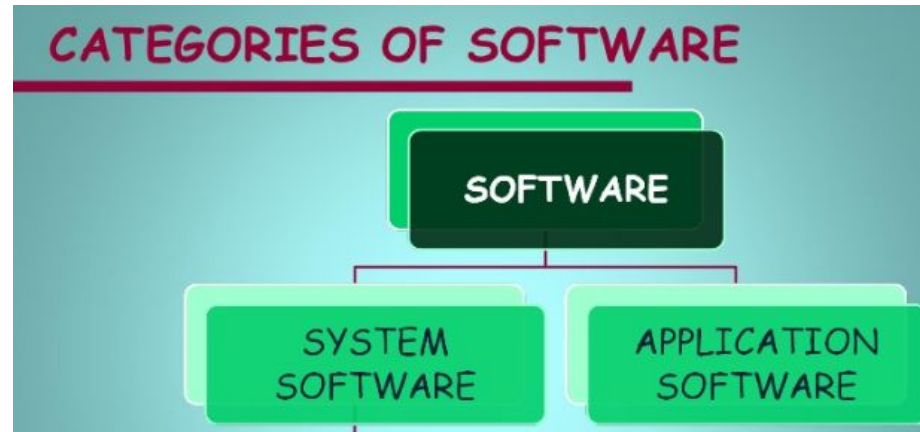


# Let's remember...

## □ What is Software?

Software is a program which consists of a set of instructions that tell the computer how to perform a specific operation

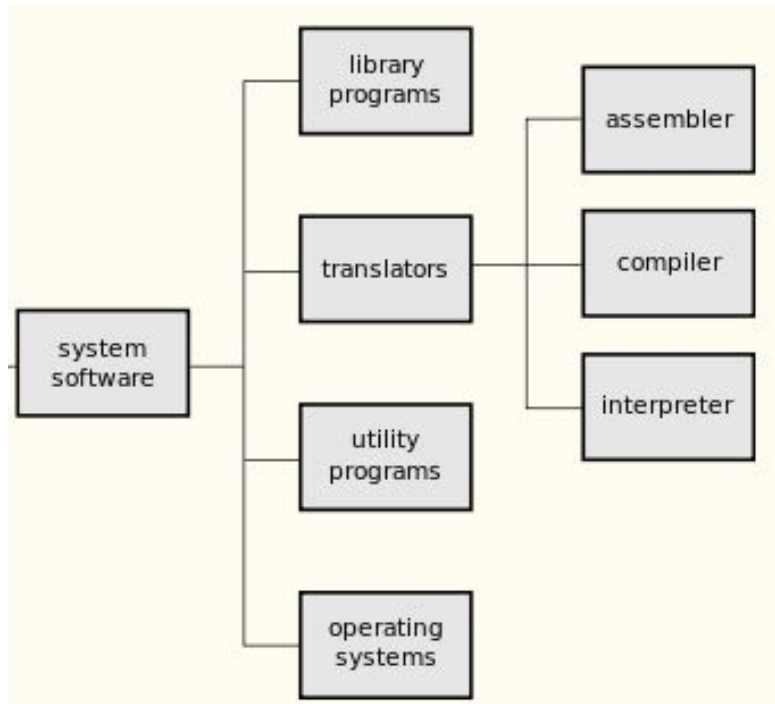
## □ What types of software do you know?



□ What is System Software?

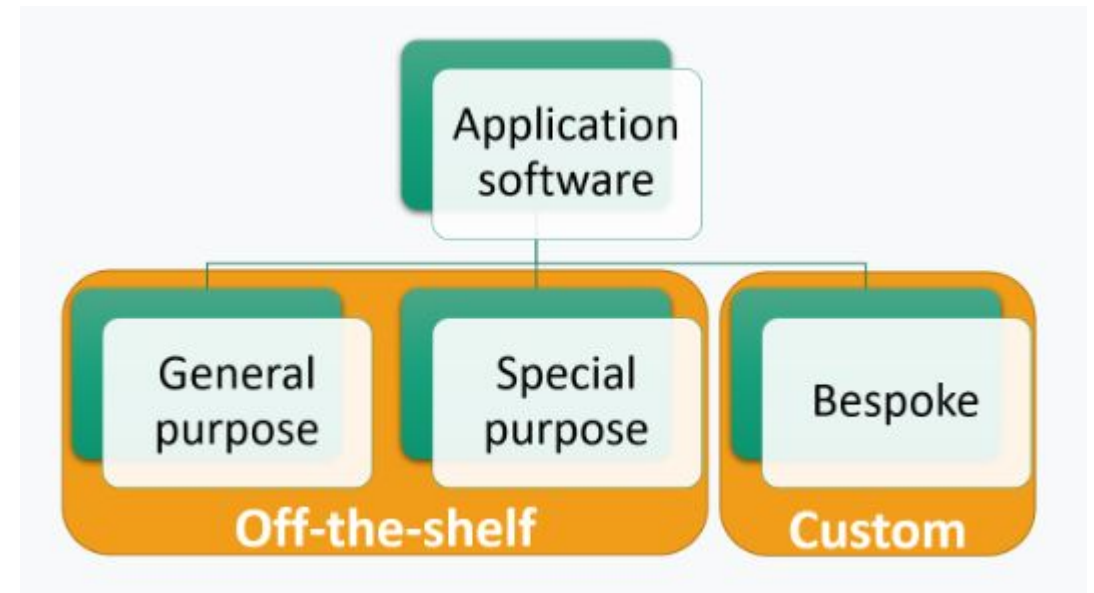
# System Software & Application software

software designed to operate the computer hardware and to provide a platform for running application software



□ What is Application software?

software designed to help the user to perform specific tasks



## Activity 1.

Group work

# Active learning methods

## The Method Of "Speakers"



### •*Instruction:*

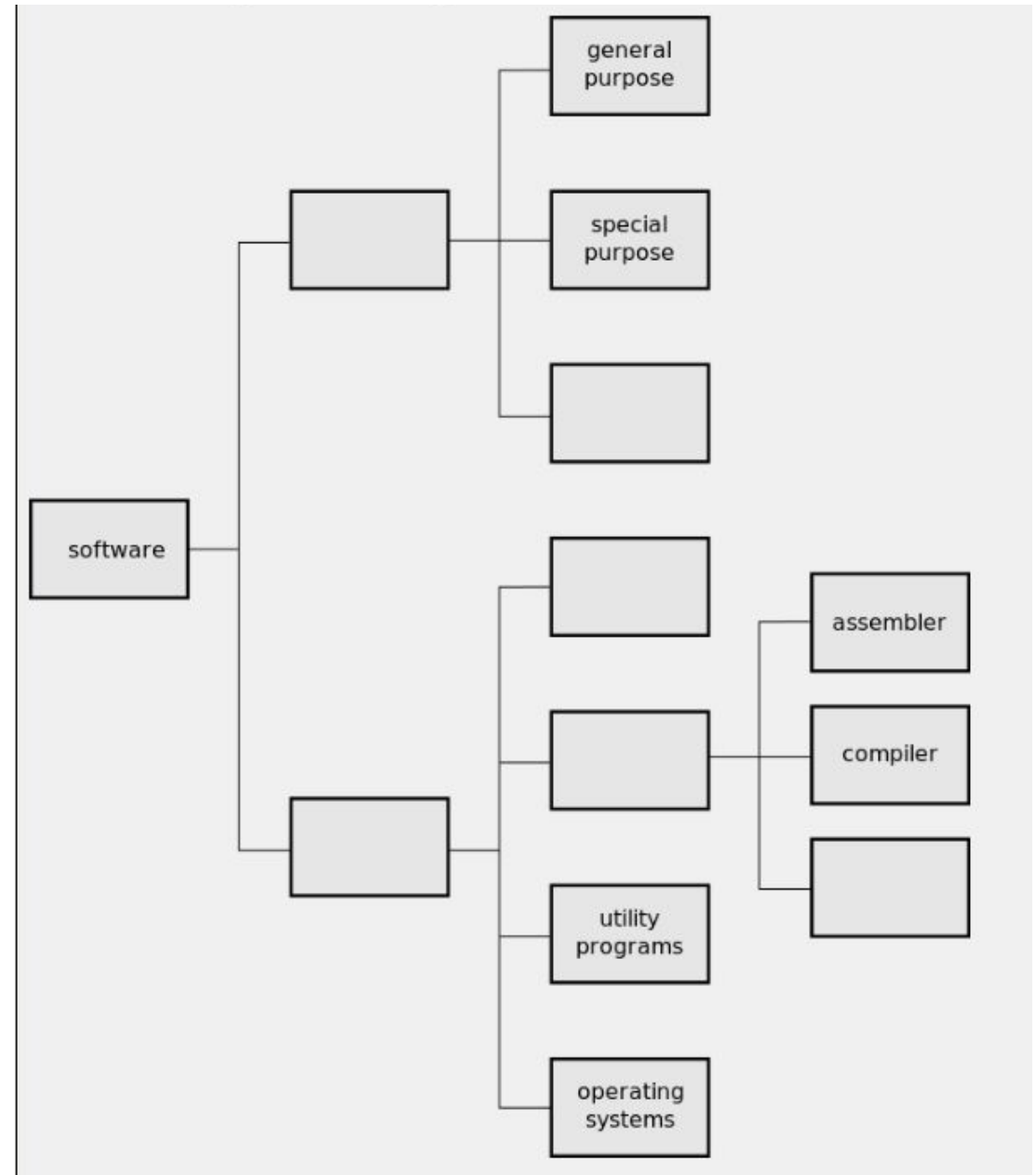
- 1. Divide into 3 groups (1<sup>st</sup> group, 2<sup>nd</sup> group, 3<sup>rd</sup> group)
- 2. In the group, read and discuss the text.
- 3. After reading the text, one student in the group is selected as a “speaker” and speaks to the general group to explain their material.

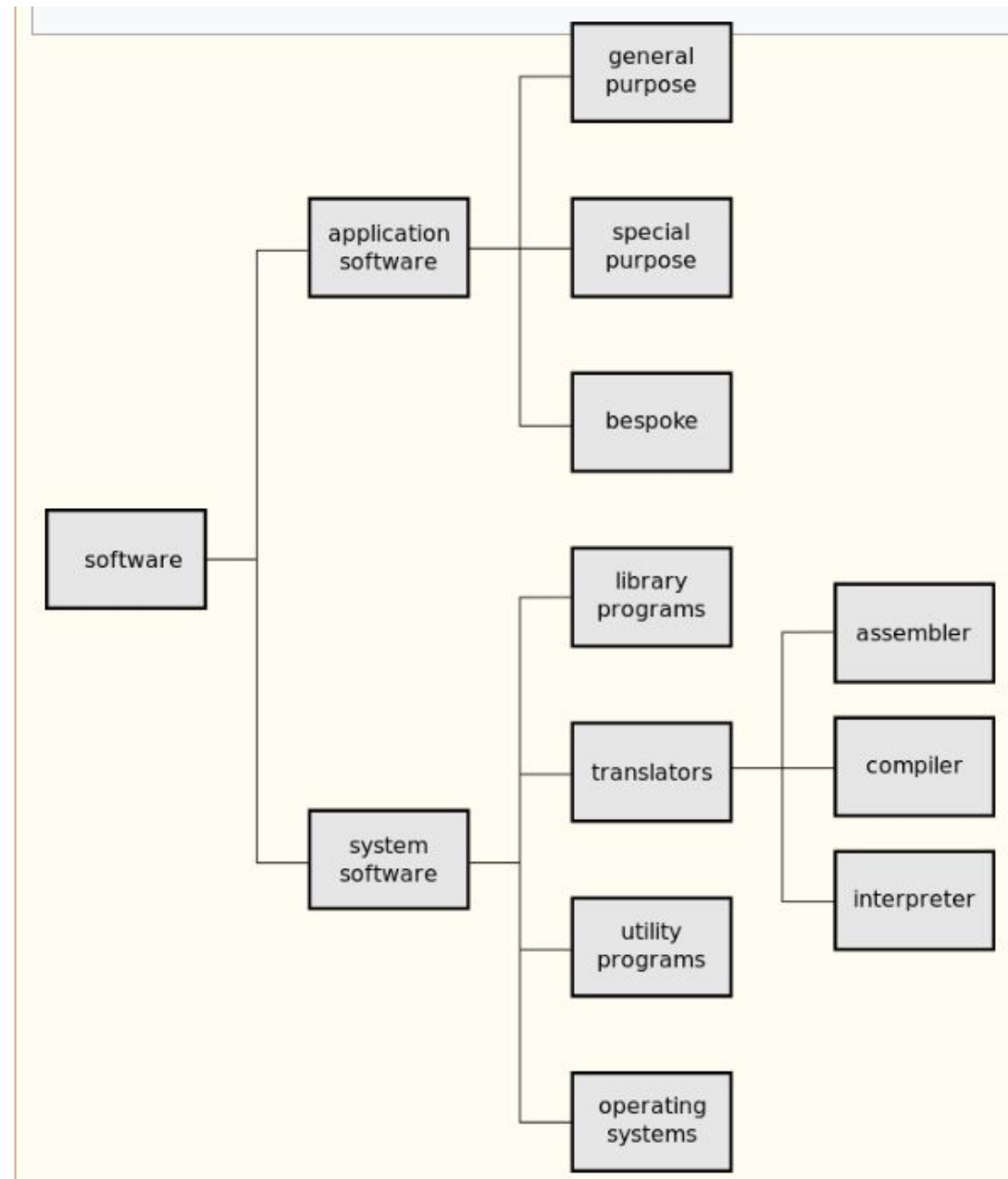


Work in pairs.

## Activity 2.

Fill in the missing software categories





## Activity 3. Do it by yourself



- <https://learningapps.org/watch?v=pw2jsb1et20> – define correct answer
- <https://learningapps.org/watch?v=pht407axt20> - classify application software into groups
- <https://learningapps.org/watch?v=p5j4jjzj520> - fill in the gaps “Types of application software”
- <https://learningapps.org/watch?v=pta3j2w7a20> - Identify the advantages and disadvantages for each type of application software

# Formative assessment

Individual work. **Activity 5.**



Please answer the questions in the classtime

<https://www.classtime.com/code/N2MWN>  
Q

Session N2MWNQ  
0/7 answered

- 1. What are the two main categories of software?
- 2. Why is software important for computer systems?
- 3. Place each of these software products into its correct category (application or system): Word processor
- 4. Place each of these software products into its correct category (application or system): Operating system
- 5. Place each of these software products into its correct category (application or system): Defragmenter
- 6. Place each of these software products into its correct category (application or system): GPS mapping software

Question 1  
not answered

What are the two main categories of software?

- / 1 pts

Type your answer here...

0 words

Submit

**Learning objectives**

**11.3.1.1 justify the choice of applied software and choice criteria based on the goals**

**Successful criteria**

Learners will:

- know the types of Application software and System software
- Understands why is software important for computer systems;
- distinguishes software for its category;



# Individual work. Activity 6.

## AQA exam question. Peer assessment



- 6 (a) The operating system (OS) contains code for performing various management tasks.

The appropriate code is run when the user performs various actions.

Draw a line to link each OS management task to the appropriate user action.

OS management task	Action
Main memory management	The user moves the mouse on the desktop
Input/Output management	The user closes the spreadsheet program
Secondary storage management	The user selects the Save command to save their spreadsheet file
Human computer interface management	The user selects the Print command to output their spreadsheet document

[3]

- (b) Utility software is usually pre-installed on a new computer.

The following table lists four programs. Put **one** tick (✓) in each row to indicate whether or not the program is utility software.

Program	True	False
Disk Defragmenter		
Word Processor		
Library Program		
Compression Software		

[4]

- (b) A user has the following issues with the use of his PC.

State the utility software which should provide a solution.



# Reflection

- A. How can you demonstrate your understanding?
- B. How can you apply what you have learned?

