Progression of declarative and procedural knowledge in Computing to support sequential planning, scaffolding and challenge in lessons.

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National Curriculum Computing Programme of Study
Aims The national curriculum for computing aims to ensure that all pupils:

♣ can understand and apply the fundamental principles and concepts of computer science, including abstraction, logic, algorithms and data representation
♣ can analyse problems in computational terms, and have repeated practical experience of writing computer programs in order to solve such problems
♣ can evaluate and apply information technology, including new or unfamiliar technologies, analytically to solve problems
♣ are responsible, competent, confident and creative users of information and communication technology.

Computing Strands and knowledge organisation

There are three stands to the subject of computing

- ❖ **Computer Science**
- ❖ **Information Technology**
- ❖ **Digital Literacy**

Computing as a discipline is a broad mixture of concepts and skills that need to be represented in any structure.

The Teach Computing Curriculum uses the National Centre for Computing Education's computing taxonomy to ensure comprehensive coverage of the subject. All learning outcomes can be described through a high-level of ten strands:

Taxonomy strand	Description
Algorithms	Being able to comprehend, design, create, and evaluate algorithms
Programming	Writing software to allow computers to solve problems
Data and Information	How data is stored, organised, and used to represent real-world artefacts and scenarios
Computer Systems	What is a computer, how do its constituent parts function together as a whole
Networks	Understand how networks can be used to retrieve and share information and come with associated risks
Creating media	Select and create a range of media including text, images, sounds and video
Design and development	The activities involved in planning, creating and evaluating computing artefacts
Effective use of tools	Use software tools to support computing work
Impact of technology	How individuals, systems, and society interact with computer systems
Safety and security	Understanding risks when using technology and how to protect individuals and systems

The taxonomy provides categories and an organised view of content to encapsulate the discipline of computing. **Whilst all strands are present at all phases, they are not always taught explicitly.*

	COMPUTING SYSTEMS AND NETWORKS					
	YEAR 1	**YEAR 2**	**YEAR 3**	**YEAR 4**	**YEAR 5**	**YEAR 6**
	TECHNOLOGY AROUND US	**IT AROUND US**	**CONNECTING COMPUTERS**	**THE INTERNET**	**SYSTEMS & SEARCHING**	**COMMUNICATION & COLLABORATION**
	I can…	**I can…**	**I can…**	**I can…**	**I can…**	**I can…**
Declarative (skills)	- choose a piece of technology to do a job. -recognise that some technology can be used in different ways -identify the main parts of a computer. -use a mouse in different ways. -use a keyboard to type. -use the keyboard to edit text. -show how to use technology safely.	-describe some uses of computers -identify information technology in school -identify information technology beyond school. -show how to use information technology safely.	-identify input and output devices. -explain that a computer system accepts an input and processes it to produce an output. -explain how a computer network can be used to share information -explain the role of a switch, server, and wireless access point in a network -identify network devices around me -explain how networks can be coonected to other networks		- describe the input and output of a search engine - demonstrate that different search terms produce different results - evaluate the results of search terms	-
	I know…	**I know…**	**I know…**	**I know…**	**I know…**	**I know…**
Procedural (concepts)	-technology is something that can help us. -how to identify examples of technology. -how to explain how examples of technology help us -how to recognise a computer is an example of technology -how to recognise that choices are made when using technology -how to explain why rules are needed when using technology.	-different types of computers used in school -a computer is a part of information technology -how to recognise the features of information technology -how to talk about uses of information technology -explain how information technology benefits us -how rules for using information technology can help us -how to recognise that choices are made when using information technology	-how to describe what an output is -how to explain that a process acts on the inputs -how to explain that an output is produced by the process -how to identify how changing the can affect the output -how to recognise that a digital device is made up of several parts -how to recognise that computers can be connected to each other. -how to explain how computer systems can change the way that we work -how to identify how devices in a network are connected with another -how to recognise that a network is made up of a number of computers -how to explain how information is passed through multiple connections -how to identify the benefits of computer networks	- how to describe how networks connect to other networks - how to outline how information can be shared via the World Wide Web - how to recognise that the World Wide Web is part of the internet - how to explain that the global interconnection of networks is the internet - how to recognise the need for security on the internet - how to describe how to access the World Wide Web - how to describe the types of content/media that can be added, created, and shared on the World Wide Web - how to explain how the content of the World Wide Web is created, owned, and shared by people - how to explain that the internet enables us to view the World Wide Web - how to explain that the World Wide Web comprises of websites and web pages - how to describe the current limitations of World Wide Web media - how to evaluate the reliability of content and the consequences of unreliable content - how to explain the benefits of the World Wide Web	- how to recognise that a system is a set of interconnected parts which work together - how to explain that computers can be connected together to form IT systems - how to identify that data can be transferred between IT systems - how to recognise inputs, processes, and outputs in large IT systems - how to describe the role of a particular IT system in their lives - how to relate that search engines are examples of large IT systems -how to explain why search engines create indices, and that they are different for each search engine - how to explain the role of web crawlers in creating an index - how to explain how search results are selected - how to explain that ranking orders search results to make them more useful - how to explain how ranking is determined by rules, and that different search engines use different rules - how to explain why the order of results is important and to whom -how to explain how search engines make money by selling targeted advertising space -how to identify some of the limitations of search engines	*- how to recognise that computers use addresses to access the worldwide web* *- how to identify and explain the main parts of a data packet* *- how to send information over the internet in different ways* *- how to demonstrate that working together on the internet can be public or private.* *- how to explain the variety of ways to communicate over the internet.* *-how to explain that communication on the internet may not always private.* *- when it is appropraite to share information on line and when it is not.*

	CREATING MEDIA					
	YEAR 1	**YEAR 2**	**YEAR 3**	**YEAR 4**	**YEAR 5**	**YEAR 6**
	DIGITAL PAINTING	**DIGITAL PHOTOGRAPHY**	**STOP FRAME ANIMATION**	**AUDIO PRESENTATION**	**VIDEO PRODUCTION**	**WEB PAGE CREATION**
	I can…	**I can…**	**I can…**	**I can…**	**I can…**	**I can…**
Declarative (skills)	-create a picture using freehand tools. -use shape and line tools when precision is needed. -use a range of paint colours. -use the fill tool to colour an enclosed area -use the undo button to correct a mistake -combine a range of tools to create a piece of artwork	-capture a digital image -take photographs in both landscape and portrait format -view photographs on a digital device -decide which photographs to keep -hold the camera still to take a clear photograph -use zoom to change the composition of a photograph -consider lighting before taking a photograph -use simple editing tools to change the appearanceof a photograph -improve a photograph by retaking it	-set up the work area with an awareness of what will be captured. -plan an animation using a storyboard -capture an image -use the onion skinning tool to review subject position -move a subject between captures. -review a captured sequence of frmaes as an animation. -remve frames to improve an animation	- record sound using a computer - play recorded audio - import audio into a project - delete a section of audio - change the volume of tracks in a project	- use different camera angles - use pan, tilt and zoom - identify features of a video recording device or application - combine filming techniques for a given purpose - determine what scenes will convey your idea - decide what changes I will make when editing - choose to reshoot a scene or improve later through editing - use split, trim and crop to edit a video	- review an existing website (navigation bars, header) - create a new blank web page - add text to a web page - set the style of text on a web page - embed media in a web page - change the appearance of text - add web pages to a website - nsert hyperlinks to another site - nsert hyperlinks between pages - preview a web page (different screen sizes)
	I know…	**I know…**	**I know…**	**I know…**	**I know…**	**I know…**
Procedural (concepts)	-how to explain what different freehand tools do -how to recognise computers can be used to create art -how to recognise a tool can be adjusted to suit my need -how to decide when it's appropriate to use each tool -how to consider impact of choices made -how to compare painting using a computer with painting using brushes	-how to recognise that some digital devices can capture images using a camera -how to talk about how to take a photograph - how to recognise that photographs can be saved and viewed later - how to make choices when composing my photograph - how to recognise features of 'good' photographs - how to identify how a photograph could be improved To recognise features of 'good' photographs - how to explain the effect of lighton a photograph - how to recognise that photographs can be change after they have been taken - how to recognise that some images are not accurate	- how to explain that an animation is made up of a sequence of images. - how to identify that a capturing device needs to be in a fixed position. - how to recognise that smaller movements create smoother animation - how to explain the need for consistency in working	- how to identify that sound can be recorded - how to identify that an input device is needed to record sound - how to identify that output devices are needed to play audio - how to recognise that recorded audio can be stored on a computer - how to recognise that audio can be edited - how to recognise that sound can be represented visually as a waveform - how to recognise that audio can be layered so that multiple sounds can be played at the same time - how to consider the results of editing choices made	- how to explain the features of video as a visual media format - how to recognise which devices can and can't record video - how to explain the purpose of a storyboard - how to recognise that filming techniques can be used to create different effects - how to recognise the need to regularly review and reflect on a video project - how to identify videos can be improved through and reshooting or editing - how to identify that videos can be edited on a recording device or on a computer - how to explain the limitations of editing video on a recording device - how to recognise projects need to be exported to be shared	- how to recognise the relationship between HTML and visual display - how to recognise that web pages can contain different media types - how to recognise that web pages are written by people - recognise that a website is a set of hyperlinked web pages - how to recognise components of a web page layout - how to consider the ownership and use of images (copyright) - how to recognise the need to preview pages (different screens / devices) - how to recognise the need for a navigation path - how to recognise the implications of linking to content owned by others

	PROGRAMMING A					
	YEAR 1	**YEAR 2**	**YEAR 3**	**YEAR 4**	**YEAR 5**	**YEAR 6**
	MOVING A ROBOT	**ROBOT ALGORITHMS**	**SEQUENCING SOUNDS**	**REPETITION IN SHAPES**	**SELECTION IN PHYSICAL COMPUTING**	**VARIABLES IN GAMES**
	I can…	**I can…**	**I can…**	**I can…**	**I can…**	**I can…**
Declarative (skills)	-enact a given word -predict the outcome of a command on a device -list which commands can be used on a given device -run a command on a floor robot -choose a command for a given purpose -choose a series of words that can be enacted as a program -choose a series of commands that can be run as a program -build a sequence of commands in steps -combine commands in a program -run a program on a device	-choose a series of words that can be enacted as a sequence -choose a series of instructions that can be run as a program -create a program -trace a sequence to make a prediction -run a program on a device -debug a program that I have written	-build a sequence of commands -combine commands in a program -order commands in a program -creat a sequence of commands to produce a given outcome	- list an everyday task as a set of instructions including repetition - use an indefinite loop to produce a given outcome - use a count-controlled loop to produce a given outcome - plan a program that includes appropriate loops to produce a given outcome - recognise tools that enable more than one process to be run at the same time (concurrency) - create two or more sequences that run at the same time	- create a condition-controlled loop - use a condition in an 'if...then…' statement to start an action - use selection to switch the program flow in one of two ways - use a condition in an 'if...then...else…' statement to produce given outcomes	- identify a variable in an existing program - experiment with the value of an existing variable - choose a name that identifies the role of a variable to make it easier for humans to understand it - decide where in a program to set a variable - update a variable with a user input - use an event in a program to update a variable - use a variable in a conditional statement to control the flow of a program - use the same variable in more than one location in a program
	I know…	**I know…**	**I know…**	**I know…**	**I know…**	**I know…**
Procedural (concepts)	- how to recall words that can be enacted - how to explain what a given command does - how to match a command to an outcome - how to understand that a program is a set of commands that a computer can run - how to recall that a series of instructions can be issued before they are enacted	- how to describe that a series of instructions is a sequence - how to explain what happens when we change the order of instructions - how to recall that a series of instructions can be issued before they are enacted - how to recognise that you can predict the outcome of a program - programming projects can be improved with code and artwork.	- how to explain that programs start because of an input - how to explain what a sequence is - how to identify that a program includes sequences of commands - how to identify that the sequence of a program is a process - how to explain that the order of commands can affect a program's output - how to identify that different sequences can achieve the same output - how to identify that different sequences can achieve different outputs	- how to relate what 'repeat' means - how to identify everyday tasks that include repetition as part of a sequence, eg brushing teeth, dance moves - how to explain that we can use a loop command in a program to repeat instructions - how to identify patterns in a sequence - how to identify a loop within a program - how to explain that in programming there are indefinite loops and count-controlled loops - how to explain that an indefinite loop will run until the program is stopped - how to explain that you can program a loop to stop after a specific number of times - how to identify patterns in a sequence, eg 'step 3 times' means the same as 'step, step, step' - how to justify when to use a loop and when not to - how to explain the importance of instruction order in a loop - how to recognise that not all tools enable more than one process to be run at once	- how to explain that a condition can only be true or false - how to relate that a count-controlled loop contains a condition - how to compare a count-controlled loop with a condition-controlled loop - how to explain that a condition-controlled loop will stop when a condition is met - how to explain that when a condition is met, a loop will complete a cycle before it stops - how to explain that selection can be used to branch the flow of a program - how to explain that a loop can be used to repeatedly check whether a condition has been met - how to explain the importance of instruction order in 'if...then...else...' statements	- how to define a 'variable' as something that is changeable - how to identify examples of information that is variable, for example, a football score during a match - how to explain that a variable can be used in a program, eg 'score - how to define a program variable as a placeholder in memory for a single value - how to explain that a variable has a name and a value - how to recognise that the value of a variable can be used by a program - how to recognise that the value of a variable can be updated - how to identify that variables can hold numbers (integers) or letters (strings) - how to define the way that a variable is changed - how to recognise that a variable can be set as a constant (fixed value) - how to explain the importance of setting up a variable at the start of a program (initialisation) - how to explain that there is only one value for a variable at any one time - how to explain that if you change the value of a variable, you cannot access the previous value (cannot undo) - how to explain that if you read a variable, the value remains - how to explain that the name of a variable is meaningless to the computer - how to explain that the name of a variable needs to be unique

	DATA AND INFORMATION					
	YEAR 1	**YEAR 2**	**YEAR 3**	**YEAR 4**	**YEAR 5**	**YEAR 6**
	GROUPING DATA	**PICTOGRAMS**	**BRANCHING DATABASES**	**DATA LOGGING**	**FLAT FILE DATABASES**	**INTRODUCTION TO SPREADSHEETS**
	I can…	**I can…**	**I can…**	**I can…**	**I can…**	**I can…**
Declarative (skills)	-identify some attributes of an object -collect simple data -show that collected data can be counted -describe the properties of an object -choose an attribute to group objects by -group objects to answer questions -explain that objects can be grouped by similarities (attribute) -describe a group of objects (based on commonality)	-show I can enter data onto a computer -recognise that people, animals and objects can be described by attributes -use a computer to view data in different formats -use pictograms to answer single-attribute questions -use a computer to answer comparison questions (graphs, tables)	- create questions with yes/no answers -choose questions that will divide objects into evenly sized subgroups - repeatedly create subgroups of objects - identify an object using a branching database - retrieve information from different levels of the branching database	- use a digital device to collect data automatically - choose an appropriate timeframe when collecting data automatically - use a set of logged data to find information - use a computer program to sort data by one attribute - export information in different formats	- choose different ways to view data - choose which attribute and value to search by to answer a given question (operands) - ask questions that need more than one attribute to answer - choose which attribute to sort data by to answer a given question - choose multiple criteria to search data to answer a given question (AND and OR) - select an appropriate graph to visually compare data - choose suitable ways to present information to other people	- calculate data using a formula for each operation - use functions to create new data - use existing cells within a formula - choose suitable ways to present spreadsheet data
	I know…	**I know…**	**I know…**	**I know…**	**I know…**	**I know…**
Procedural (concepts)	- how to identify that objects can be counted - how to recognise that information can be presented - how to recognise that information can be presented in different ways	- how to use a tally chart to collect data - how to compare objects that have been grouped by attribute - how to suggest appropriate headings for tally charts and pictograms - how to construct (complete) a given comparison question, *e.g.Are there more --- balls than --- balls?* - how to use a computer program to present information in different ways - how to explain that we can present information using a computer - how to give simple examples of why some information should not be shared	- how to investigate questions with yes/no answers - how to identify attributes that you can ask yes/no questions about - how to select an attribute to separate objects into two similarly sized groups - how to explain that a branching database is an identification tool - how to recognise that a data set can be structured using yes/no questions - how to relate two levels of a branching database using AND suggest real-world applications for branching databases - how to explain that a well-structured branching database will enable you to identify objects using fewer questions	- how to suggest questions that can be answered using a table of data - how to identify data that can be logged over time - identify that sensors are input devices - how to recognise that a sensor can be used as an input device for data collection. - how to explain that a data logger captures ‘data points’ from sensors over time.	- how to explain that a computer program can be used to organise data - how to explain that tools can be used to select data to answer questions - how to outline how ordering data allows us to answer some questions - how to outline how operands can be used to filter data - how to outline how ‘AND’ and ‘OR’ can be used to refine data selection - how to explain that computer programs can be used to compare data visually - how to explain that we present information to communicate a message	- how to identify questions that can be answered using spreadsheet data - how to explain what an item of data is in a spreadsheet - how to outline that there are different software tools to work with data - how to explain how the data type determines how a spreadsheet can process the data - how to explain that formulas can be used to produce calculated data - how to recognise cells can be linked - how to explain why data should be organised in a spreadsheet - how to recognise that a cell's value automatically updates when the value in a linked cell is changed - how to evaluate results in comparison to the question asked

	CREATING MEDIA					
	YEAR 1	**YEAR 2**	**YEAR 3**	**YEAR 4**	**YEAR 5**	**YEAR 6**
	DIGITAL WRITING	**DIGITAL MUSIC**	**DESKTOP PUBLISHING**	**PHOTO EDITING**	**INTRODUCTION TO VECTOR GRAPHICS**	**3D MODELLING**
	I can…	**I can…**	**I can…**	**I can…**	**I can…**	**I can…**
Declarative (skills)	-use letter, number, and Space keys to enter text into a computer - use punctuation and special characters - use the Backspace key to remove text - position the text cursor in a chosen location - select text - choose options to achieve a desired effect - change the appearance of text on a computer	- experiment with musical patterns on a computer - experiment with different sounds on a computer -use a computer to create a musical pattern - use a computer to compose a rhythm and a melody on a given theme - use a computer to play the same music in different ways (e.g. tempo) -evaluate a musical composition created on a computer - improve a musical composition created on a computer	- show that page orientation can be changed -organise text and image placeholders in a page layout - add text to a placeholder - edit text in a placeholder - choose fonts and apply effects to text - add and remove images to and from placeholders - move resize and rotate images - review a document	- recognise that digital images can be manipulated - recognise that digital images can be changed for different purposes - choose the most appropriate tool for a particular purpose - consider the impact of changes made on the quality of the image		- position 3D shapes relative to one another - use digital tools to modify 3D objects - combine objects to create a 3D digital artefact - use digital tools to accurately size 3D objects - construct a 3D model which reflects a real world object
	I know…	**I know…**	**I know…**	**I know…**	**I know…**	**I know…**
Procedural (concepts)	- how to recognise that a keyboard is used to enter text into a computer - how to recognise that the Shift key changes the output of a key - how to recognise that text can be changed - how to recognise that the appearance of text can be changed - how to recognise that text can be edited - how to consider the impact of choices made	- how to identify that computers can be used to play sounds of different instruments - how to identify that the same pattern can be represented in different ways - how to compare playing music on instruments with making music on a computer	- how to recognise how text and images can be used together to convey information - how to define landscape and portrait as two different page orientations - how to consider how different layouts can suit different purposes - how to recognise that DTP pages can be structured with placeholders - how to recognise how different font styles and effects are used for particular purposes - how to consider the benefits of using a DTP application	- how to use an application to change the whole of a digital image - how to use an application to change part of a digital image - how to use an application to add to the composition of a digital image - how to change the composition of a digital image by rotating and flipping - how to change the composition of a digital image by cropping - how to adjust colours of a digital image - how to apply filters to a digital image - how to apply effects to a digital image - how to select part of a digital image - how to use clone, copy, and paste to change the composition of a digital image - how to use cloning to retouch a digital image - how to add text to a digital image	*- know how vector drawings are made using different shapes* *- how to move, resize and rotote objects* *- how to use tools to modify drawings and images.* *- how to use layering to create an image* *- how develop my vector drawing and when there is a need to group and ungroup objects* *- how to create vector drawings for a specific purpose*	- how to explain that 3D models can be created on a computer - how to recognise that a 3D environment can be viewed from different perspectives - how to recognise that digital tools can be used to manipulate 3D objects - how to show how placeholders can create holes in 3D objects - how to recognise that artefacts can be broken down into a collection of 3D objects

	PROGRAMMING B					
	YEAR 1	**YEAR 2**	**YEAR 3**	**YEAR 4**	**YEAR 5**	**YEAR 6**
	PROGRAMMING ANIMATIONS	PROGRAMMING QUIZZES	EVENTS & ACTIONS IN PROGRAMS	REPETITION IN GAMES	SELECTION IN QUIZZES	SENSING
	I can…	**I can…**	**I can…**	**I can…**	**I can…**	**I can…**
Declarative (skills)	- choose a series of words that can be enacted as a program -choose a series of commands that can be run as a program - run a program on a device	- choose a series of words that can be enacted as a sequence -explain what happens when we change the order of instructions - choose a series of commands that can be run as a program -trace a sequence to make a prediction -test a prediction by running the sequence -create and debug a program that I have written -run a program on a device	-build a sequence of commands -combine commands in a program -order commands in a program -create a sequence of commands to produce a given outcome	- list an everyday task as a set of instructions including repetition - use an indefinite loop to produce a given outcome - use a count-controlled loop to produce a given outcome - plan a program that includes appropriate loops to produce a given outcome - recognise tools that enable more than one process to be run at the same time (concurrency) - create two or more sequences that run at the same time	- choose a condition to use in a program - create a condition-controlled loop - use a condition in an 'if... then…' statement to start an action - use selection to switch program flow - use 'if... then... else…' to switch program flow in one of two ways	- identify a variable in an existing program - experiment with the value of an existing variable - choose a name that identifies the role of a variable to make it more usable (to humans) - decide where in a program to set a variable - update a variable with a user input - use an event in a program to update a variable - use a variable in a conditional statement to control the flow of a program -use the same variable in more than one location in a program
	I know…	**I know…**	**I know…**	**I know…**	**I know…**	**I know…**
Procedural (concepts)	- how to enact a given word - how to recall words that can be enacted - how to predict the outcome of a command on a device - how to list that commands can be used on a given device - how to explain what a given command does - how to match a command to an outcome - how to recognise how to run a command (press a button) - how to choose a command for a given purpose - how to understand that a program is a set of commands a computer can run - how to recall that a series of instructions can be issued before they are enacted - how to build a sequence of commands in steps - how to combine commands in a program	- how to describe a series of instructions as a 'sequence' - how to recall that a series of instructions can be issued before they are enacted - how to use logical reasoning to predict the outcome of a program	- how to explain that programs start because of an input - how to explain what a sequence is - how to identify that a program includes sequences of commands - how to identify that the sequence of a program is a process - how to explain that the order of commands can affect a program's output - how to identify that different sequences can achieve the same output - how to identify that different sequences can achieve different outputs	- how to relate what 'repeat' means - how to identify everyday tasks that include repetition as part of a sequence, eg brushing teeth, dance moves - how to explain that we can use a loop command in a program to repeat instructions - how to identify patterns in a sequence - how to identify a loop within a program - how to explain that in programming there are indefinite loops and count-controlled loops - how to explain that an indefinite loop will run until the program is stopped - how to explain that you can program a loop to stop after a specific number of times - how to identify patterns in a sequence, eg 'step 3 times' means the same as 'step, step, step' - how to justify when to use a loop and when not to - how to explain the importance of instruction order in a loop - how to recognise that not all tools enable more than one process to be run at once	- how to explain that a condition can only be true or false - how to relate that a count-controlled loop contains a condition - how to compare a count controlled loop with a condition-controlled loop - how to explain that a condition-controlled loop will stop when a condition is met - how to explain that when a condition is met a loop will complete a cycle before it stops - how to explain that selection can be used to branch the flow of a program - how to explain that a loop can be used to repeatedly check whether a condition has been met - how to explain the importance of instruction order in 'if... then... else...' statements	- how to define 'variable' as something that is changeable - how to identify examples of information that is variable, e.g. a football score during a match - how to define a program variable as a placeholder in memory for a single value - how to explain that a variable can be used in a program, e.g. 'score' - explain that a variable has a name and a value - how to recognise that the value of a variable can be used by a program - how to recognise that the value of a variable can be updated -identify that variables can hold numbers (integers) or letters (strings) - how to define the way that a variable is changed - how to recognise that a variable can be set as a constant (fixed value) - how to explain the importance of setting up a variable at the start of a program (initialisation) - how to explain that there is only one value for a variable at any one time - how to explain that if you change the value of a variable, you cannot access the previous value (cannot undo) - how to explain that if you read a variable, the value remains - how to explain that the name of a variable is meaningless to the computer - how to explain that the name of a variable needs to be unique