



## **COMPUTING CURRICULUM**

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## **1. INTENT, IMPLEMENTATION AND IMPACT**

### **Intent**

The aim of the Computing curriculum at Croft C of E Primary School is to provide a high-quality computing education; which equips children to build and apply computational thinking and creativity. The curriculum will teach children key knowledge in a safe and responsible manner.

We provide a knowledge rich, varied curriculum which fuses both key skills and concepts together whilst also challenging pupils to become greater computational thinkers. By using progressive objectives and revisiting strands, across year groups, using a range of themes, hardware and software, it allows children to securely embed knowledge by applying key skills.

A key part of learning is online safety. This is taught through Computing lessons as well as PSHCE lessons and assemblies. This enables children to become responsible, competent, confident and creative users of technology, both at school and at home.

We want children to leave Croft C of E Primary School confident to use a range of hardware and software and to be able to produce high-quality purposeful products. At Croft C OF E Primary School, the curriculum we use gives pupils pieces of a toolkit which enables them to move forward to be an active participant in a vast growing digital world, becoming confident and respectful digital citizens, making the impossible possible and creating solutions to problems in everyday life.

### **Implementation**

We have chosen to implement computing through the 'Plan it!' scheme. This programme of work gives all teaching staff the confidence and the knowledge to best embed and cover every element of the computing curriculum.

A variety of hardware and software is used to create engaging lessons that challenge the pupil's computational thinking. This can mean doing lessons away from the computer.

### **Impact**

Our approach to the curriculum results in a fun and engaging computing education. The quality of children's learning is evident in their confident and competency to navigate digital technology and through discussions and evaluation of their own work, as well as their peers.

Knowledge and understanding is monitored by assessing the work according to outcomes. This is used to feed into teachers' future planning, and it enables teachers to revisit misconceptions and

knowledge gaps in future teaching. The outcomes of pupils is monitored by the class teacher, subject lead and SLT through assessment and marking, tracking, book scrutiny and pupil interviews.

Much of the subject-specific knowledge developed in our computing lessons equips pupils with experiences which will benefit them in secondary school, further education and future workplaces. Computing at Croft C of E Primary School gives children the building blocks that enable them to pursue a wide range of interests and vocations in the next stage of their lives and ensure they are competent and safe users of technology.

### **Assessment**

Assessment is ongoing throughout each computing topic. For each lesson a feedback sheet is completed, detailing misconceptions and next steps for learning. If a child has a misconception these are addressed in the lesson or addressed in subsequent lessons. Summative assessment can be seen in a number of different ways in lessons.

## 2. NATIONAL CURRICULUM COVERAGE

	EYFS /Year 1			Year 2/3		
	AUT	SPR	SUM	AUT	SPR	SUM
Pupils Should be taught to:						
1. Recognise common uses of information technology beyond school.						
2. Use technology purposefully to create, organise, store, manipulate and retrieve digital content.						
3. Use technology safely and respectfully, keeping personal information private.						
4. Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions.						
5. Create and debug simple programs.						
6. Use logical reasoning to predict the behaviour of simple programs.						

	Year 3 /4			Year 5/6		
	AUT	SPR	SUM	AUT	SPR	SUM
Pupils Should be taught to:						
1. Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts.						
2. Use sequence, selection, and repetition in programs; work with variables and various forms of input and output.						
3. Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs.						
4. Understand computer networks including the internet; how they can provide multiple services, such as the world wide web; and the opportunities they offer for communication and collaboration.						
5. Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content.						
6. Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information.						
7. Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.						

### 3. LONG TERM PLAN

	AUTUMN		SPRING		SUMMER	
<b>EY/Y1 Ruby</b>	On-line safety	Computer skills	Painting	Programming toys	Word processing	Scratch Jr
<b>Y2/Y3 Diamond</b>	Online safety	Technology around us	Computer Art	Preparing for Turtle logo& Scratch	Presentation skills	Using the internet
<b>Y3/Y4 Topaz</b>	Online safety	Communication & Collaboration	Scratch: Questions & quizzes	Programming Turtle logo	Word processing	Animation
<b>Y5/Y6 Amethyst</b>	Online safety	Strategic Searching Online	Scratch: Developing Games	Flowol	Radio Station	3D modelling: Sketch up

#### 4. PROGRESSION OF SKILLS

	RUBY	Diamond and Topaz	Amethyst
Multimedia Text and Images	<p>Children can:</p> <ul style="list-style-type: none"> <li>a add text strings, text boxes and show and hide objects and images, manipulating the features;</li> <li>b use various tools, such as brushes, pens, eraser, stamps and shapes, and set the size, colour and shape;</li> <li>c use applications and devices in order to communicate ideas, work, messages and demonstrate control;</li> <li>d save, retrieve and organise work;</li> <li>e use key vocabulary to demonstrate knowledge and understanding in this strand: paint, colour, brush, tools, settings, undo, redo, text, image, size, poster, launch, application, software, window, minimise, restore, size, move, screen, close, click, drag, log on, log off, keyboards, keys, mouse, click, button, double click, drag, present.</li> </ul>	<p>Children can:</p> <ul style="list-style-type: none"> <li>a create different effects with different technological tools, demonstrating control;</li> <li>b use appropriate keyboard commands to amend text on a device;</li> <li>c use applications and devices in order to communicate ideas, work, and messages;</li> <li>d save, retrieve and evaluate work, making amendments;</li> <li>e insert a picture/text/graph/hyperlink from the internet or a personal file;</li> <li>f use key vocabulary to demonstrate knowledge and understanding in this strand: draw, object, shape, line, line colour, fill colour, group, ungroup, font, size, text box, format, image, wrap text, plan, link, image, object, link, hyperlink, minimise, restore, size, move, screen, split, create, organise, file, folder, close, exit, search, print, password, screenshot, snipping tool, shift, undo, redo, menu, dictionary, highlight, cursor, toolbar, spellcheck.</li> </ul>	<p>Children can:</p> <ul style="list-style-type: none"> <li>a use the skills already developed to create content using unfamiliar technology;</li> <li>b select, use and combine the appropriate technology tools to create effect;</li> <li>c review and improve their own work and support others to improve their work;</li> <li>d save, retrieve and evaluate their work, making amendments;</li> <li>e insert a picture/text/graph/hyperlink from the internet or personal file;</li> <li>f use key vocabulary to demonstrate knowledge and understanding in this strand: window, layout, text, font, colour, format, heading, hyperlink, 2D shape, 3D shape, orbit, pan, zoom, eraser, dimension, measurement, guide.</li> </ul>
Multimedia Sound and Motion	<p>Children can:</p> <ul style="list-style-type: none"> <li>a use software to record sounds;</li> <li>b change sounds recorded;</li> <li>c save, retrieve and organise work;</li> <li>d use key vocabulary to demonstrate knowledge and understanding in this strand: commands, add sound.</li> </ul>	<p>Children can:</p> <ul style="list-style-type: none"> <li>a use software to record, create and edit sounds and capture still images;</li> <li>b change recorded sounds, volume, duration and pauses;</li> <li>c use software to capture video for a purpose;</li> <li>d crop and arrange clips to create a short film;</li> <li>e plan an animation and move items within each animation for playback;</li> <li>f use key vocabulary to demonstrate knowledge and understanding in this strand: audio, sound, video, movie, embed, link, file format, animate, animation, still image, thaumatrope, zoetrope, zoopraxiscope, stereoscope, flip book, frame, onion skinning, loop, frame rate, record, stop, play, stop motion, stop frame.</li> </ul>	<p>Children can:</p> <ul style="list-style-type: none"> <li>a collect audio from a variety of resources including own recordings and internet clips;</li> <li>b use a digital device to record sounds and present audio;</li> <li>c trim, arrange and edit audio levels to improve quality;</li> <li>d publish their animation and use a movie editing package to edit/refine and add titles;</li> <li>e use key vocabulary to demonstrate knowledge and understanding in this strand: audio, record, edit, play stop, skip, waveform, input, output, record, edit, play podcast, digital content, downloadable, backing track, voiceover, mute, gain, production, post-production, documentary, project, evaluation, screening, ceremony, upload.</li> </ul>

<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Handling Data</p>		<p>Children can:</p> <ul style="list-style-type: none"> <li>a talk about the different ways data can be organised;</li> <li>b sort and organize information to use in other ways;</li> <li>c search a ready-made database to answer questions;</li> <li>d use key vocabulary to demonstrate knowledge and understanding in this strand: Google Docs, insert, table.</li> </ul>	<p>Children can:</p> <ul style="list-style-type: none"> <li>e construct data on the most appropriate application;</li> <li>f know how to interpret data, including spotting inaccurate data and comparing data;</li> <li>g use keyboard shortcuts and functions to input data on spreadsheets and create formulas for spreadsheets;</li> <li>h add data to an existing database;</li> <li>i use key vocabulary to demonstrate knowledge and understanding in this strand: Google Docs, insert, table, spreadsheet, cell, row, column, formula/formulas, calculate, format, edit, insert, ascending, descending.</li> </ul>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Technology in Our Lives</p>	<p>Children can:</p> <ul style="list-style-type: none"> <li>a recognise ways that technology is used in the home and community, e.g. taking photos, blogs, shopping;</li> <li>b use links to websites to find information;</li> <li>c recognise age-appropriate websites;</li> <li>d use safe search filters;</li> <li>e use key vocabulary to demonstrate knowledge and understanding in this strand: filter, Google, search engine, image, keyboard, email, internet, subject, address, communicate, sender, safe, secure.</li> </ul>	<p>Children can:</p> <ul style="list-style-type: none"> <li>a explain ways to communicate with others online;</li> <li>b describe the world wide web as the part of the internet that contains websites;</li> <li>c add websites to a favourites list;</li> <li>d use search tools to find and use an appropriate website and content;</li> <li>e use strategies to improve results when searching online;</li> <li>f use key vocabulary to demonstrate knowledge and understanding in this strand: filter, Google, search engine, image, keyboard, email, subject, address, communicate, sender, safe, secure, internet, world wide web, social media.</li> </ul>	<p>Children can:</p> <ul style="list-style-type: none"> <li>a search for information using appropriate websites and advanced search functions within Google;</li> <li>b use strategies to check the reliability of information (cross-check with another source such as books);</li> <li>c talk about the way search results are selected and ranked;</li> <li>d check the reliability of a website, including the photos on site;</li> <li>e tell you about copyright and acknowledge the sources of information;</li> <li>f use key vocabulary to demonstrate knowledge and understanding in this strand: world wide web, search, search engine, advanced search, results, Google, browser, terms of use, bias, authority, citation, plagiarism, source, website, secure, https, site, domain, website, browser, address bar.</li> </ul>

Coding and Programming	<p>Children can:</p> <ul style="list-style-type: none"> <li>a give commands one at a time to control direction and movement, including straight, forwards, backwards, turn;</li> <li>b control the nature of events: repeat, loops, single events and add and delete features;</li> <li>c give a set of instructions to follow and predict what will happen;</li> <li>d improve/change their sequence of commands by debugging;</li> <li>e use key vocabulary to demonstrate knowledge and understanding in this strand: algorithm, instruction, order, debug, program, turn, left, right, clockwise, anticlockwise, blocks, sequence, project, repeat, repeat forever, invisible, grow, shrink.</li> </ul>	<p>Children can:</p> <ul style="list-style-type: none"> <li>a use logical thinking to solve an open-ended problem by breaking it up into smaller parts;</li> <li>b write a program, putting commands into a sequence to achieve a specific outcome;</li> <li>c give a set of instructions to follow and predict what will happen;</li> <li>d keep testing a program and recognise when it needs to be debugged;</li> <li>e use variables to create an effect, e.g. repetition, if, when, loop;</li> <li>f use key vocabulary to demonstrate knowledge and understanding in this strand: decompose, decomposing, logical sequence, flowchart, sprite, block, command, algorithm, answer, correct, errors, program, algorithm, instructions, commands, forward (fd), left (lt), right (rt), move, turn, clear screen (cs), variable.</li> </ul>	<p>Children can:</p> <ul style="list-style-type: none"> <li>a use external triggers and infinite loops to demonstrate control;</li> <li>b follow a sequence of instructions, e.g. in a flowchart and modify a flowchart using symbols;</li> <li>c use conditional statements and edit variables;</li> <li>d decompose a problem into smaller parts to design an algorithm for a specific outcome and use this to write a program;</li> <li>e keep testing a program and recognise when it needs to be debugged;</li> <li>f use key vocabulary to demonstrate knowledge and understanding in this strand: flowchart, algorithm, control, output, symbol, start, stop, delay, process, decision, loop, backdrop, script, block, repeat, commentary, sequence, consequence, debug, program, Kodu, world, object, tool palette, program environment, smooth, flatten, raise.</li> </ul>
Online Safety	<p>Children can:</p> <ul style="list-style-type: none"> <li>a identify what things count as personal information;</li> <li>b identify what is appropriate and inappropriate behaviour on the internet;</li> <li>c agree and follow sensible online safety rules, e.g. taking pictures, sharing information, storing passwords;</li> <li>d seek help from an adult when they see something that is unexpected or worrying;</li> <li>e demonstrate how to safely open and close applications and log on and log off from websites;</li> <li>f use key vocabulary to demonstrate knowledge and understanding in this strand: safe, meet, accept, reliable, tell, online, trusted, adult, information, safety, personal, key, question, tell, safe, share, stranger, danger, internet.</li> </ul>	<p>Children can:</p> <ul style="list-style-type: none"> <li>a reflect on their own digital footprint and behaviour online;</li> <li>b identify what is appropriate and inappropriate behaviour on the internet, recognising the term cyberbullying;</li> <li>c agree and follow sensible online safety rules, e.g. taking pictures, sharing information, storing passwords;</li> <li>d seek help from an adult when they see something that is unexpected or worrying;</li> <li>e demonstrate understanding of age-appropriate websites and adverts;</li> <li>f use key vocabulary to demonstrate knowledge and understanding in this strand: safe, meet, accept, reliable, tell, online, trusted, adult, information, safety, personal, internet, world wide web, communicate, message, social media, email, password, cyberbullying/bullying, plagiarism, profiles, account, private, public.</li> </ul>	<p>Children can:</p> <ul style="list-style-type: none"> <li>a protect their password and other personal information;</li> <li>b be a good online citizen and friend;</li> <li>c judge what sort of privacy settings might be relevant to reducing different risks;</li> <li>d seek help from an adult when they see something that is unexpected or worrying;</li> <li>e discuss scenarios involving online risk;</li> <li>f use key vocabulary to demonstrate knowledge and understanding in this strand: spam, link, privacy, virus, scam, phishing, inbox, junk, sender, subject, secure, safe, account, online, private, social media, adverts, cyberbullying, reporting, anonymous, victim, fraud/fraudulent, policy, private/personal.</li> </ul>



## 5. SEND IN COMPUTING

We teach Computing to all children, whatever their ability. DT forms part of the school's curriculum policy to provide a broad and balanced education to all children. We provide learning opportunities matched to the needs of children with learning difficulties and we consider each child's abilities.

*"A core principle of the Teach Computing Curriculum is inclusive and ambitious. The Teach Computing Curriculum has been written to support all pupils. Each lesson is sequenced so that it builds on the learning from the previous lesson, and where appropriate, activities are scaffolded so that all pupils can succeed and thrive. Scaffolded activities provide pupils with extra resources, such as visual prompts, to reach the same learning goals as the rest of the class. Exploratory tasks foster a deeper understanding of a concept, encouraging pupils to apply their learning in different contexts and make connections with other learning experiences. As well as scaffolded activities, embedded within the lessons are a range of pedagogical strategies which support making computing topics more accessible."* Teach Computer – Teacher Guide – Core Principle.

TASKS	PROBLEM SOLVING	HIGH EXPECTATIONS
<p>Incorporate learning materials that are accessible for learners of all abilities. For learners with special educational needs and disabilities, specific resources or approaches may be required to enable them to access the curriculum. Ensure you have considered what barriers learners may have within a lesson and embed support strategies to help them overcome these. Scaffold learning so that learners benefit from support during initial phases of learning. Adapt tasks to make the curriculum accessible to all.</p>	<p>In computer science, there can be multiple solutions to a problem. Focus your instruction and encouragement on solving problems and the problem-solving process, rather than finding a single right answer.</p> <p>Emphasize guided inquiry, designing learning opportunities where learners can ask questions, explore, try different approaches and challenge their own and each other's ideas.</p> <p>Encourage learners to take ownership over their learning. If a learner struggles with complex, multi-step problem solving, give them additional support in the beginning, then slowly remove the support once learners build their skills and confidence.</p>	<p>One of the largest subject barriers we face is learners' own belief systems about who can succeed in computer science. If a teacher holds lower expectations of a learner, it can have a negative impact on a learner's achievement in the subject. Encourage learners to reflect on their perspectives and potential biases and challenge yourself to do the same. Build relationships with learners to identify opportunities to connect learning to their personal experience. Look for stories and experiences about using computer science that will be meaningful and relatable to your learners.</p>
<b>Creating an Inclusive Environment</b>		
Vocabulary	Vision Impairment	Space
<p>Whilst you model the skills and understanding required to develop a rich vocabulary knowledge, consider your use of words within a lesson.</p>	<p>At Key Stage 1 and 2, coding is primarily taught using block-based programming languages such as Scratch. Carefully consider what inclusive practices are appropriate. For example, embedding the use of braille,</p>	<p>The learning environment is important in making learners feel included. Incorporate visuals that will appeal to a wide range of learner interests and backgrounds. Include examples of learners and</p>

<p>Familiarise learners with Tier 2 words by embedding them into classroom displays and lesson activities. It's important that you find ways for learners to encounter these terms, as this will empower them to access a higher level of language with which they can communicate and understand ideas across the curriculum.</p>	<p>allowing learners to orient themselves to the classroom space, careful selection of colours within resources, installing a screen reader and magnifier aids. Together these approaches support learners in solving complex challenges.</p>	<p>professionals with disabilities, the representation of a diverse range of figures in computing can send a powerful message to your learners. Arrange the learning space to promote collaboration and hands-on activities, whilst also being mindful of how learners will access their workstations. Arrange aisles and workstations so that learners with mobility aids can get to all the areas they need to access to participate fully. Consider what assistive technology devices could be embedded into practice to give opportunities for all learners to fully access lesson content.</p>
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Curriculum Considerations	Key Stage 1	Key Stage 2
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<p>Computing equips learners to use computational thinking and creativity to understand the digital world we live in. Computing has deep links with mathematics, science and design and technology, and ensures that learners become digitally literate, offering the opportunity to learn in different ways.</p>	<p>At this stage, learning should be focused on the concept of computational thinking and equipping learners with the skills to tackle challenging problems using logical reasoning. Practical activities that encourage them to get hands-on with problems can help them visualise solutions. Giving learners the opportunity to predict behaviour of simple programs can also develop their problem-solving skills. It's important to use and to teach learners the correct technical terminology within lessons, to ensure that misconceptions are not embedded early into their computing education.</p>	<p>At this stage, learners begin to apply and build upon the skills learnt at Key Stage 1 through designing and writing programs that accomplish specific goals. Learners should be able to detect and correct errors in algorithms. When teaching learners to solve various problems, encourage them to be resilient and think outside the box. Learners should also be shown how to use technology safely, respectfully and responsibly. Learners need to be able to identify unacceptable behaviour and know how to report concerns.</p>
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Strategies to Scaffold Learning			
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<p>How can I support learners who struggle to access lessons because of literacy difficulties?</p>	<p>How can I support learners who struggle to retain vocabulary?</p>	<p>How can I support learners who need additional time to develop conceptual understanding?</p>	<p>How can I support learners who struggle with attention?</p>
<p>Model the correct use of vocabulary. Show examples of common errors/misconceptions and work with</p>	<p>Embed opportunities to recall key terms within lessons. Memorisation techniques such as tracked retrieval</p>	<p>Model answers and get learners to look at and discuss completed examples.</p>	<p>Learn what hobbies or topics the learners are interested in. Find ways to incorporate this into lessons and questions. Use learners' names in</p>

<p>learners to improve literacy within given text.</p> <p>For those with appropriate access arrangements, encourage the use of a reader to support learners in reading and interpreting large sections of text.</p> <p>Chunk key information and create clear, easy-to-follow checklists. This can help your learner focus on one section at a time and have a clear set of goals.</p> <p>During classroom discussions, listen to the answers given and when re-iterating points, rephrase sentences to include key vocabulary.</p> <p>Consider your classroom display and how you can promote the definitions and use of Tier 2 words.</p> <p>Provide learners with a glossary of key terms which they can refer to during the lesson</p>	<p>practice can give learners the opportunity to revisit topics across the curriculum.</p> <p>Provides learners with a glossary of key terms which they can refer to during the lesson.</p> <p>Use rephrasing techniques to strengthen learner answers with correct vocabulary.</p> <p>Introduce new terms slowly and rehearse news words. Get learners to interact with the key terms in various ways such as writing, speaking, mini games, questioning and more.</p>	<p>Assess and use learners' prior knowledge to create links between old and new content.</p> <p>Walk through examples together, giving learners the opportunity to ask questions.</p> <p>Address misconceptions early.</p>	<p>written questions to further engage them in text.</p> <p>Give clear instructions within the form of a checklist. This will break down the task into more manageable chunks.</p> <p>Praise learners on their contributions and for targets met, encourage them to continue and to have a growth mindset.</p> <p>Consider the learning environment and potential distractions and make appropriate arrangements to remove these barriers.</p> <p>Ensure instructions are clear and signposted.</p> <p>Be concise in teacher-led delivery. Chunk material in larger topics so learners can complete a range of engaging activities.</p> <p>Check in with the learners throughout the activity, initially to check they have understood the task, to praise work completed and to challenge them further.</p>
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## 6. KEY KNOWLEDGE AND VOCABULARY

EYFS/Year 1	Year 2/3	Year 3/4	Year 5/6
To explain that technology is something that can help us.	To recognise different types of computers used in school.	To recognise that the World Wide Web is part of the internet.  To outline how information can be shared via the World Wide Web.	To explain that computers can be connected together to form IT systems.  To explain how search results are selected.
To recognise computers can be used to create art.  To recognise that a keyboard is used to enter text into a computer.  To recognise that the appearance of text can be changed	To recognise that some digital devices can capture images using a camera.  To recognise that photographs can be change after they have been taken.  To identify that computers can be used to play sounds of different instruments.	To identify that an input device is needed to record sound.  To identify that output devices are needed to play audio.  To recognise that audio can be edited.  To use an application to change a part or a whole digital image.	To identify that a vector drawing comprises separate objects and can be modified separately or as groups.  To recognise that filming techniques can be used to create different effects.  To identify that videos can be edited on a recording device or on a computer.
To recognise that information can be presented.	To explain that we can present information using a computer.  To use a computer program to present information in different ways.	To recognise that a sensor can be used as an input device for data collection, over time.	To explain that a computer program can be used to organise data.  To explain that computer programs can be used to compare data visually.
To understand that a program is a set of commands that a computer can run.  To combine commands in a program.	To describe that a series of instructions is a sequence.  To recognise that you can predict the outcome of a program.  To explain what happens when we change the order of instructions.	To explain that we can use a loop command in a program to repeat instructions.  To explain that in programming there are indefinite loops and count-controlled loops.	To explain that selection can be used to branch the flow of a program.  To explain that a loop can be used to repeatedly check whether a condition has been met.

## 7. RESOURCES AND WEBSITES

Ofsted [Research review series: computing - GOV.UK \(www.gov.uk\)](https://www.gov.uk/research-review-series-computing)

Teach Computing Curriculum <https://teachcomputing.org/curriculum>