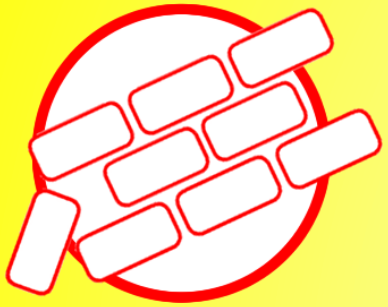
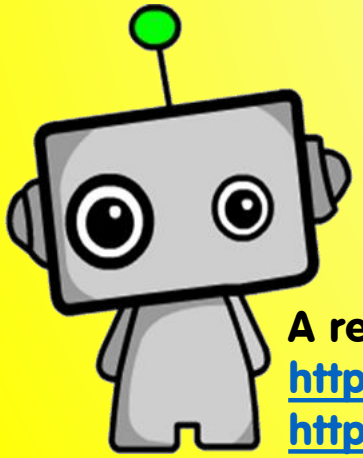


Digital Competence and Computational Thinking

Practical ideas for promoting Computational Thinking across the curriculum



A resource by: @RobbotResources
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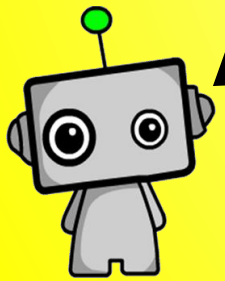
Digital Competence and Computational Thinking

A key topic within the **Digital Competence Framework** is **Computational Thinking**.

Educators will be required to integrate this concept within lessons across the curriculum.

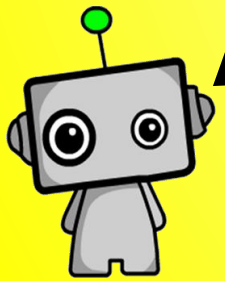
The good news is you're probably already do this!

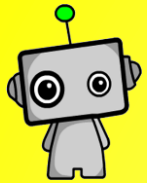


Digital Competence and Computational Thinking

The purpose of this document is to provide educators with practical ideas on how to promote the four different areas of computational thinking (Decomposition, Pattern Recognition, Abstraction and Algorithmic design) through a range of example activities, questions and games that can be applied across the whole curriculum.

As you will see, many of the concepts don't even require a computer!



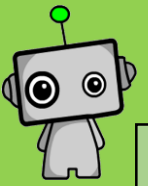


Computational Thinking Terminology

One area of concern regarding computational thinking is the terminology used to describe it's concepts (and the term "Computational Thinking" itself!).
Computational Thinking can be simplified to '**Logical Problem Solving**'.
Below are some suggestions on how it's concepts can also be simplified for different age groups;

Secondary (KS3 & KS4)	Decomposition	Pattern Recognition	Abstraction	Algorithmic Design
Primary	*"Break apart"*	*"Patterns"*	*"Thoughts"*	*"Instructions"*
Early Years Foundation	*"Pieces"*	*"Matching"*	*"Ideas"*	*"Plan"*
Explanation	Breaking something into smaller parts	Looking for similarities or trends	Focusing on what's important, ignoring what is unnecessary	Create a set of step-by-step instructions to complete a task

Application of Computational Thinking Across the Curriculum!



Decomposition

Breaking something down into smaller parts

Primary Terminology – "Break Apart"

Early Years Foundation Terminology – "Pieces"

What equipment do you need for school today?

What were the key events of the 20th Century?

What countries make up Europe?

Write a list of shopping items

Identify the playing positions in a rugby team

Play Charades!

Break down a word phonetically

Break the story of Romeo and Juliet down into it's main sections

Organise a birthday party! What will you need to think about?

Identify the instruments used within a song

Top trumps!

How does your post get to you?

Break down a typical day at school

Identify the different parts of a bike What components make up the wheel?

Build a computer game using scratch. Think about graphics, levels, character…

Pack a bag for your summer holiday

Write down a list of ingredients for a Victoria sponge cake

What characters will you create for your story?

What information do you need to work out the circumference of a circle?

How did Wales do in Euro 2016?

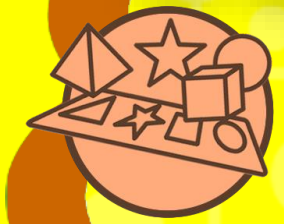
Explain the movements for the different pieces in a game of chess

Application of Computational Thinking Across the Curriculum!

Pattern Recognition

Looking for similarities or trends

Primary Terminology – "Patterns"
Early Years Foundation Terminology – "Matching"



"That word sounds like..."

Critically review an existing piece of work.

Give feedback comparing work to specific criteria

Correct application of Male/Female tenses

Sudoku

Solitaire

Chess tactics

Logic puzzles

Does the star wars and superman theme tunes sound the same?

Preferred playing positions in a sport

Pattern and sequence matching

What do platform computer games have in common?

Spot the difference

Code breaking

Days of the week/Month

Identify gradients /contours in an OS map to measure steepest route

What drawing technique would be best to use for that style of image?

"What tactics worked well the last time we played them?"

Times tables

Identify similar rifts within a song

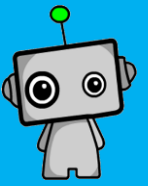
Word search

Sorting and classifying activities

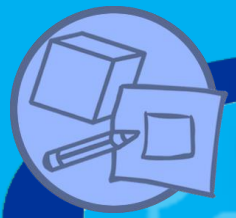
Fit shapes into correctly shaped holes

Maths patterns, e.g. Fibonacci series (1,1,2,3,5,8,13,21...)

Application of Computational Thinking Across the Curriculum!



Abstraction



Focusing on what's important, ignoring what is unnecessary

Primary Terminology – "Thoughts"

Early Years Foundation Terminology – "Ideas"

"What did you learn in todays lesson?"

Write a long term training plan

Write a blurb for your movie

Crosswords

Draw a picture of your family

What noise does a dog make?

Following a subway map

Write a match report

Create a model

What are the key skills you need to be a good Hockey player?

Draw a cartoon

Recreate the image

Explain briefly what will happen in your computer game.

Write a synopsis of your story

Explain your idea in 30 seconds!

Recreate the Eiffel Tower in Mine craft!

Articulate

Who is David Beckham?

Draw a concept design

What are the key calculations required within the formula?

From your research, summarise your key findings.

"What's your plan for the weekend?"

Demonstrate the technique used to …

Do an impression of…

"What's the weather forecast for today?"

Charades

What happened to Henry VIII's wives?

"How does that song go again?"

Application of Computational Thinking Across the Curriculum!

Algorithmic Design

Create a set of step-by-step instructions to complete a task

Primary Terminology – "Instructions"

Early Years Foundation Terminology – "Plan"

- Draw a map
- Explain the process of photosynthesis
- Write a piece of music
- Write an algorithm to show how your computer game character will move.
- Write a short term training programme
- Create a timeline of events for WWII
- Create a paint by numbers
- Making patterns
- Create a storyboard for an animation
- Create a phrase book
- Write a recipe for …
- Write out the steps for conducting your experiment
- Choreograph a dance / gymnastics routine
- Create a tactical playbook
- Create an origami
- Dot to dot
- Build a pirate ship out of Lego
- Write a shopping list
- Create a blueprint to design a …
- Draw a diagram to show the water cycle
- Create a family tree
- Create a coaching card for the tennis serve
- Create a flowchart to show how you would …
- Speed cup stacking!
- Create a how 2 guide so someone else can recreate your drawing