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BA COMPUTER GAMES DESIGN

GAMES FOR POSITIVE IMPACT

Games and Education



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Lecture Contents

- ① Play**
- ② Learning Through Role Play**
- ③ Games as a Teaching Tool**
- ④ Providing Effective Learning with Games**
- ⑤ Additional Benefits of Games**
- ⑥ The BBC Computer Literacy Project**



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Play



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TEXT HERE

Play's role in our childhood is so dominating that we cannot let go of it when we grow up.

The concepts of play are integrated into **everything we do**.

Our culture is full of behaviour patterns or templates that we use to guide our actions.



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PLAY

Chris Crawford, a game designer who worked for Atari in the 1970s and 1980s stated this about the concept of **play**:

“You can’t design games if you don’t understand play – and play is a complex and tricky behaviour.

We dismiss it too readily as child’s activity, and therefore something devoid of depth and richness, but in fact play extends far beyond the realm of the child and touches a wide range of human life.” [1]





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PLAY

Play is a vital part of a game experience – we know this through previous **module studies** on this course, and through our own **personal experience**.

While **children** are expected to engage in games and play during free time, did you also experience games in your time at school?

You may have some memories of activities that explicitly involve games, though some experiences may have been games in a **less obvious** form.





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PLAY

Games as part of development have always existed, with traditional forms of games used to engage, entertain, teach and develop children in their formative years, though in more recent times games have taken on **digital forms** alongside more traditional examples.

The continued advancement of **technology** is always offering us **new ways to engage and participate** in experiences, and many of these involve learning and development in a variety of forms.



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PLAY

Despite this, a significant amount of people consider playing games - particularly videogames - to be **unproductive**, **irresponsible** and a **waste of time** when instead learning and development could be taking place.

But playing games can actually **help** with personal, social and cognitive development, with a lot of information to support this.



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Learning Through Role Play



LEARNING THROUGH ROLE PLAY

Role play is how **children make sense of their world**, acting out experiences, ideas or stories.

Imagination, which is at the heart of children's role play, is more important than knowledge according to Albert Einstein [2]:

*“Imagination is more important than knowledge.
Knowledge is limited. Imagination encircles the world.”*



LEARNING THROUGH ROLE PLAY

Role play is often encouraged from an **early age** and has been found to help with various forms of **development** in children, such as: [3]

- Cognitive Development
- Emotional and Social Development
- Imagination and Creativity





LEARNING THROUGH ROLE PLAY

Role play is often encouraged from an **early age** and has been found to help with various forms of **development** in children, such as:

- **Cognitive Development**

Engaging in role playing can have a profound impact on a child's cognitive development. It stimulates their **thinking, problem-solving, and decision-making abilities**.

Through role play, children learn to **navigate social situations, anticipate consequences, and develop strategies to overcome challenges**. They also enhance their language skills by using dialogue and vocabulary relevant to the roles they are portraying. [3]





LEARNING THROUGH ROLE PLAY

Role play is often encouraged from an **early age** and has been found to help with various forms of **development** in children, such as:

- Emotional and Social Development

Role playing provides a **safe space** for children to express and understand their **emotions**. By taking on different roles, they can explore different perspectives, emotions, and social dynamics.

This form of play encourages **empathy, cooperation, and communication** with their playmates or siblings. It helps children develop a sense of **self-awareness** and understand the **feelings and needs of others**. [3]





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LEARNING THROUGH ROLE PLAY

Role play is often encouraged from an **early age** and has been found to help with various forms of **development** in children, such as:

- **Imagination and Creativity**

Role playing taps into a child's **imagination** and nurtures their **creative thinking**. By engaging in pretend play, they can transform everyday objects into something magical, foster **storytelling skills**, and develop their ability to **think outside the box**.

Role playing encourages them to **invent scenarios**, **problem-solve**, and explore endless possibilities, fueling their **creativity**. [3]





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LEARNING THROUGH ROLE PLAY

Role playing is a powerful tool that nurtures a child's **cognitive, emotional,** and **social development.**

By providing children with opportunities to engage in **imaginative play**, we lay the foundation for **essential skills** that will benefit them throughout their lives.

[3]





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Games as a Teaching Tool



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GAMES AS A TEACHING TOOL

The benefit of using games as a **teaching tool** results from their diversity.

There are many viewpoints about what constitutes a game, but broadly speaking **play** shifts into game when a **rule-set is introduced** or when it develops a **purpose**. Games can be paper-based, utilise a board, be physical, or digital, using consoles, mobile phones and pre-existing elements, like video games.

This variety affords the **ultimate flexibility** in how games can be incorporated into teaching.





GAMES AS A TEACHING TOOL

Uses for games in the classroom include [4]:

- Icebreaker activities
- Group working tasks
- Problem-based exercises
- Simulation and formative* assessment

***Formative assessment is a process where educators can identify areas for improvement *before* the end of a course and provide useful guidance and feedback.**



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GAMES AS A TEACHING TOOL

An **Escape Room** can make a good formative assessment tool.

Escape Rooms usually require players to **solve tasks** to break out of the 'room', generally **within a time limit**. Students work together to **solve problems** relating to what they have been learning. [4]

Performance can be observed, and feedback or guidance given after the task is completed.





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Educational Games: Crash Course Games #15 (8:15)[5]



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Providing Effective Learning With Games



PROVIDING EFFECTIVE LEARNING WITH GAMES

Kozlova states that there are **five broadly defined prerequisites** for effective learning: [6]

- ① Meaningful Context
- ② Authenticity
- ③ Motivation
- ④ Freedom to Make Mistakes
- ⑤ Learner Autonomy



PROVIDING EFFECTIVE LEARNING WITH GAMES

① Meaningful Context

Context is the glue that helps us **connect new information** to **what we already know** about the world. This is why when we learn a language, we cover a series of **topics** like family, hobbies or holidays, instead of learning all of the words in the order that they appear in a dictionary starting with A and ending with Z.

Without appropriate context, new information has **nothing to attach itself to in our brain** and becomes almost **impossible** to remember. [6]



PROVIDING EFFECTIVE LEARNING WITH GAMES

① Meaningful Context

Video games set excellent context by providing a strong and engaging narrative: a **story**. Humans are wired to connect with stories. A strong narrative is **compelling** because it **triggers an emotional response**, which in turn makes it **memorable**. That's why storytelling is such a powerful tool in marketing, politics, business and media.

When teaching young learners, **storytelling is vital**. Children rely on **episodic memory** much more than adults – remembering concrete facts and events they experienced that are linked together in learning.

Video games in general provide a **strong and engaging narrative** in which the player is intrinsically motivated to participate. [6]



PROVIDING EFFECTIVE LEARNING WITH GAMES

② Authenticity

We all know that being able to **use** a second language is more important than **knowing facts** about it. How often would you have to explain to a waiter in a foreign country which part of speech you are about to use when ordering a cup of coffee?

In real life, we speak or write or read or listen **when we have a need or a reason** to do so – we call this ‘**intrinsic motivation**’.

Video games provide similar intrinsic motivation to communicate in a meaningful context. [6]



PROVIDING EFFECTIVE LEARNING WITH GAMES

③ Motivation (Emotional Engagement)

There's a direct link between **learner motivation** and **learning outcomes** in and outside the classroom. **Engaged** learners are **focused and curious**, and generally **do better** than those who are **disinterested** or **distracted**.

Video games are very good at leveraging the **story**, the **challenges** and the **rewards** within the game to **trigger emotional response** which is directly linked to motivation. [6]



PROVIDING EFFECTIVE LEARNING WITH GAMES

④ Freedom to Make Mistakes (Failure helps you learn)

It might seem counter-intuitive, but when learning, **mistakes can be beneficial** when learners are given an opportunity to **notice** and **reflect** on them in a **safe environment**.

Video games are excellent at **providing plenty of safe opportunities to practise**. This freedom to fail in video games is important when learning something new. [6]



PROVIDING EFFECTIVE LEARNING WITH GAMES

⑤ Autonomy (Independent Decision Making)

In all kinds of teaching contexts, learner **autonomy** is another pillar of success. The more **engaged** the learner is in their own learning process, the more **fruitful the results**.

In classrooms, learners are encouraged to develop **study skills** alongside listening, writing, speaking and reading – keeping consistent **notes**, drawing **mind maps**, developing **strategies** for exams , etc. [6]



PROVIDING EFFECTIVE LEARNING WITH GAMES

⑤ Autonomy (Independent Decision Making)

In video games, the process of becoming an **independent decision maker** is naturally fostered through the nature of the task in hand: the player has to **discover ways out** of tricky situations, frequently coming back to the starting point and **starting all over again** in order to progress within the game.

In doing so, the players not only develop their sense of **curiosity**, but also **perseverance**, **problem-solving** skills and **confidence**, the usefulness of which stretches back to the classroom and beyond. [6]



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Additional Benefits of Games



ADDITIONAL BENEFITS OF GAMES

The impact of video games on society has been the subject of numerous studies.

Andrew Przybylski, a psychologist at the Internet Institute at Oxford University, published a study in the journal *Paediatrics* in 2014 establishing **how long** children should be allowed to devote to video gaming. He concluded that those who played **less than an hour** were **more emotionally stable**, while those who played for around **three hours** a day developed **social problems**. [7]

Like with so many other things in life, **moderation** is important.



ADDITIONAL BENEFITS OF GAMES

Other benefits of playing videogames include: [7]

- **They speed up response times**

Researchers at Rochester University have found that they **improve troubleshooting skills** by posing problems that must be solved in a set time.

- **They encourage teamwork**

According to Californian organisation, the Institute for the Future (ITFF), multiplayer games **boost teamwork** in problem solving.

- **They stimulate creativity, focus and visual memory**

The University of California has found that they stimulate these aspects by setting goals that require **concentration, imagination and remembering details** to achieve them.



ADDITIONAL BENEFITS OF GAMES

Other benefits of playing videogames include: [7]

- **They Improve Strategy and Leadership**

Video games put players in command, honing their abilities to **resolve disputes**, **interact** with other players and **make decisions**, found Pittsburgh University.

- **They Teach Languages**

Helsinki University found that they are useful for learning other languages through **on-screen instructions**, **chats** for communicating with other players or the **narration** of the story itself.

- **Critical Thinking**

Monterrey Institute of Technology published an article underlining the underlying ethical, philosophical and social basis of these games, and their ability to **make players think** and **improve** their critical thinking.



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Video Games in Education - Sprouts Learning (6:51) [8]



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The BBC Computer Literacy Project



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THE BBC COMPUTER LITERACY PROJECT

In the 1980s, the BBC explored the world of computing in the **Computer Literacy Project**. They commissioned a home computer built by Acorn Computers (the **Acorn Proton**, widely known as the BBC Micro) and taught viewers how to program.



The Computer Literacy Project chronicled a decade of **information technology** and was a milestone in the history of computing in Britain, helping to inspire a generation of **coders**.
[9]



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THE BBC COMPUTER LITERACY PROJECT

Some of the results by **1983** were very positive: [9]



- Audiences per programme were up to **2 million** with a reach of 18%
- The Computer book sold **80,000** copies
- Over **2 million BBC Micros** were sold (including worldwide sales)
- FE Colleges **recorded** the series
- The TV series were the most **heavily used series** in schools
- Over 85% of primary and 65% of secondary schools **opted for BBC Micros** in the government's computers in schools project



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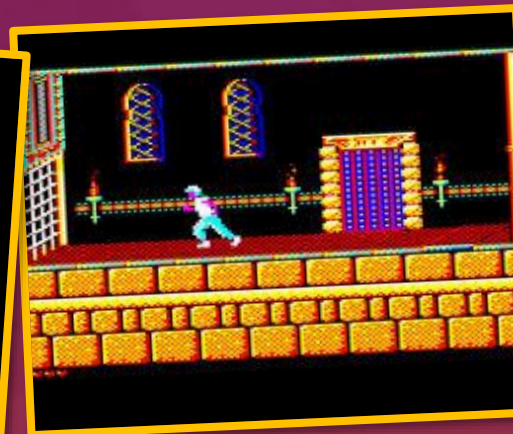
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THE BBC COMPUTER LITERACY PROJECT

The BBC Micro offered a wide selection of **educational games** intended for a variety of ages and demographics.

Simple **colour and pattern recognition games** were available alongside **numeracy and literacy** software that helped students engage with learning core subjects in a contextual manner.

It was also a competent **games platform**, but one of the downsides of being the BBC's choice for the Project, **it was closely associated with schools** by the general public through its lifetime.





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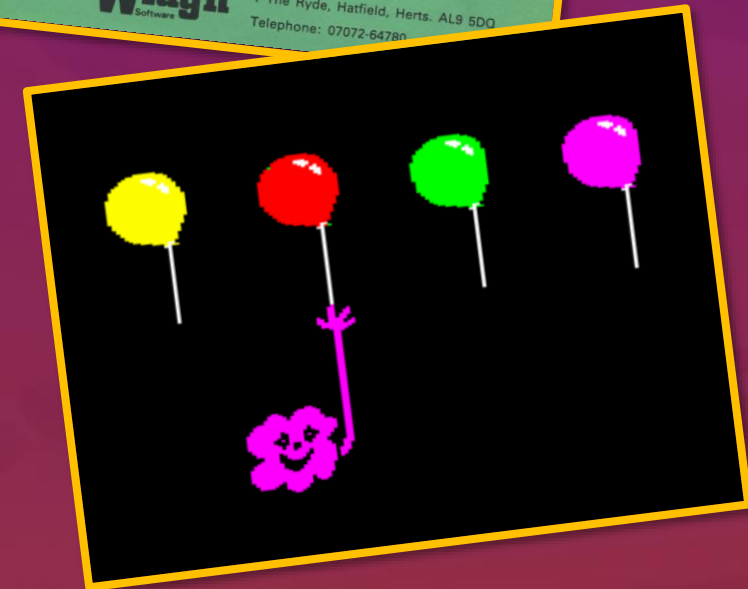
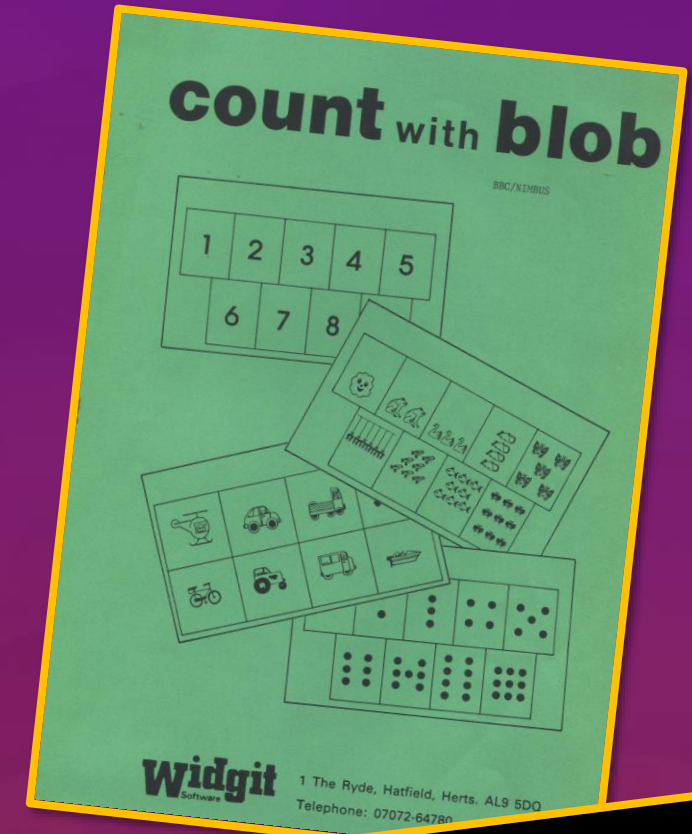
THE BBC COMPUTER LITERACY PROJECT

Some notable examples of BBC Micro educational software creators include:

Widgit Software

Widgit Software was started in **1982** by two teachers, Mike and Tina Detheridge. They initially wrote **educational games for early years** on the ZX Spectrum.

They created versions of their software for the **Commodore 64**, **BBC Micro**, and **Archimedes** before focusing entirely on **PC**. [10]





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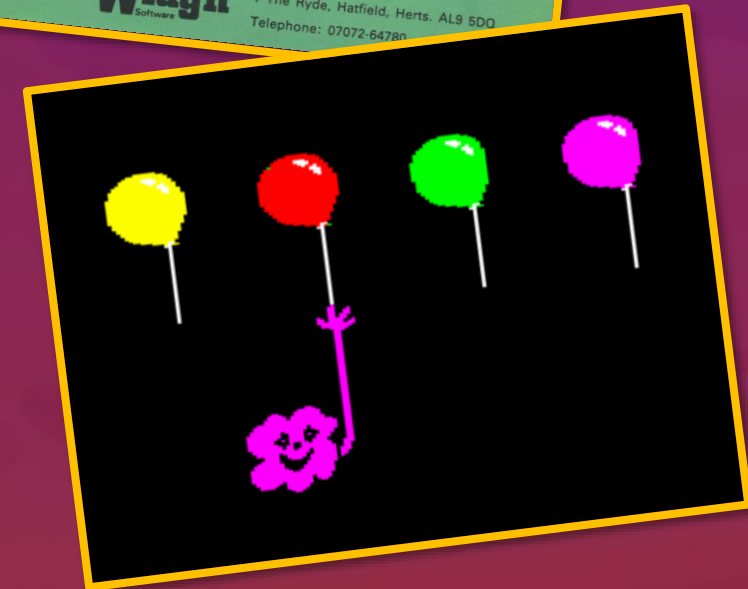
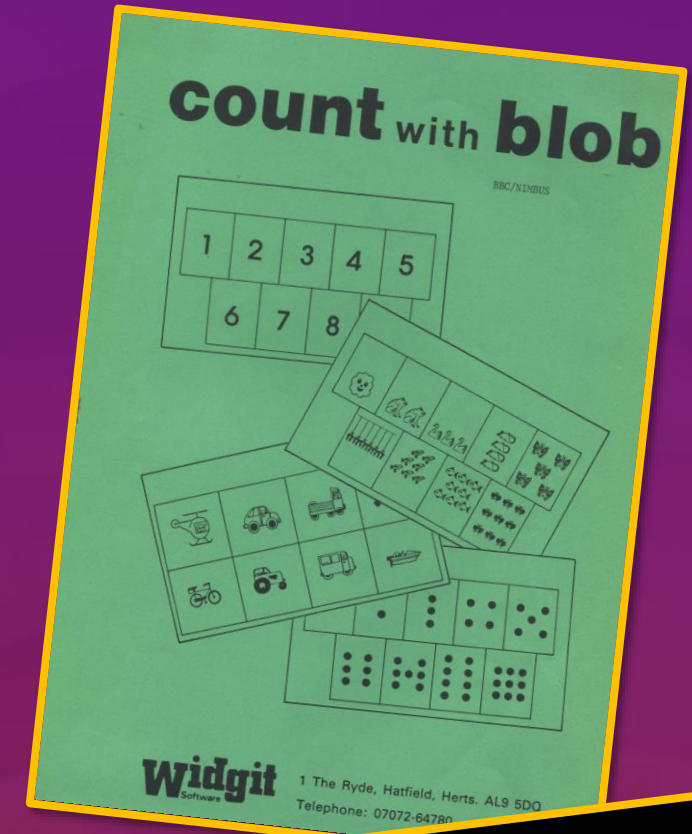
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THE BBC COMPUTER LITERACY PROJECT

Some notable examples of BBC Micro educational software creators include:

Widgit Software

An association with **Gt Ormond Street Hospital** led to the company focusing on **Special Needs** solutions, including switch activated software for young learners, and then to software that uses **graphic Symbols to give access to learning and literacy** for people with learning difficulties.





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THE BBC COMPUTER LITERACY PROJECT

Some notable examples of BBC Micro educational software creators include:

Anita Straker

Anita Straker is a British educationalist, former maths teacher, and school inspector.

After purchasing her own **Commodore PET**, she set about writing many school programs, moving onto the **BBC Micro** after the **Computer Literacy Project** was launched.

The 1990s saw Anita design the National Numeracy Strategy for primary school children, for which she received her honours from the Queen.





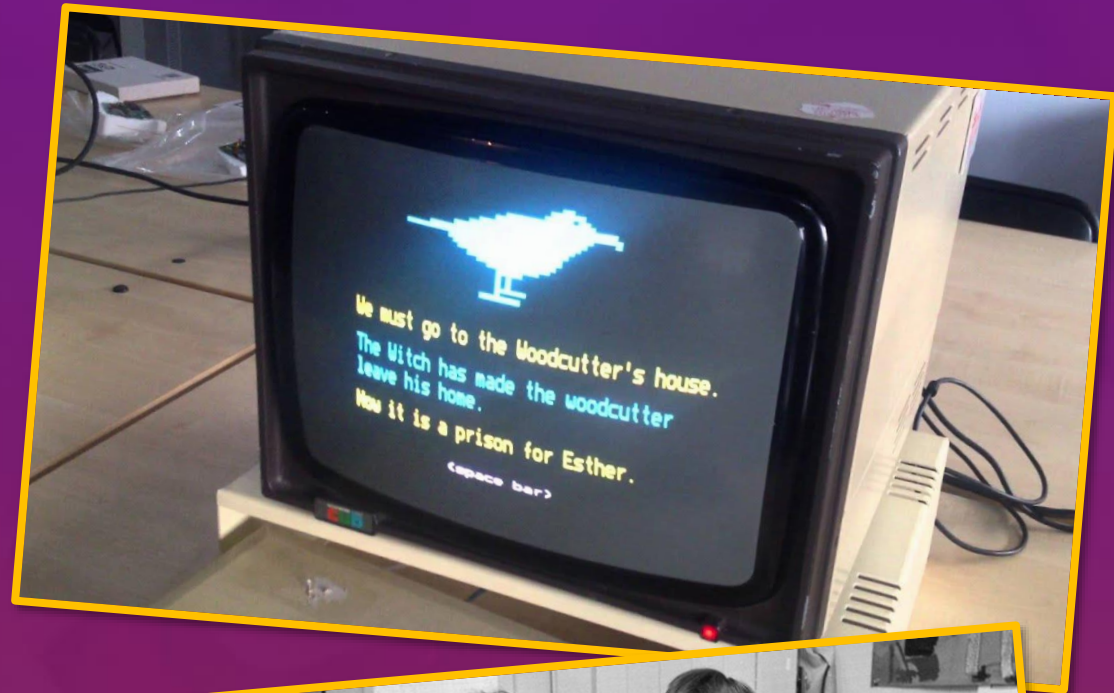
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THE BBC COMPUTER LITERACY PROJECT

Some educational games such as **Granny's Garden** released by 4Mation in 1983, were available on multiple platforms but were often associated with the **BBC Micro** because of its use in schools.

This widely-loved game became known to a generation of young children who would be some of the **first** to grow up with computers as a regular feature of their lives.





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THE BBC COMPUTER LITERACY PROJECT

In the late 1980s and early 1990s, the BBC Micro was replaced with newer, more powerful computers in UK schools – the **Archimedes A3000** and **A3020** became common in classrooms and early IT suites.

These machines, also manufactured by **Acorn**, also offered similar educational experiences for primary and secondary school pupils, with more visual content and power than their predecessors.





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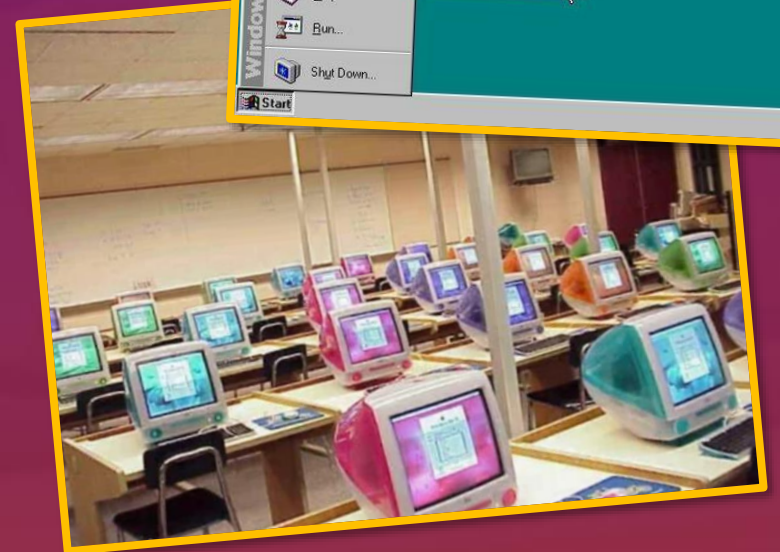
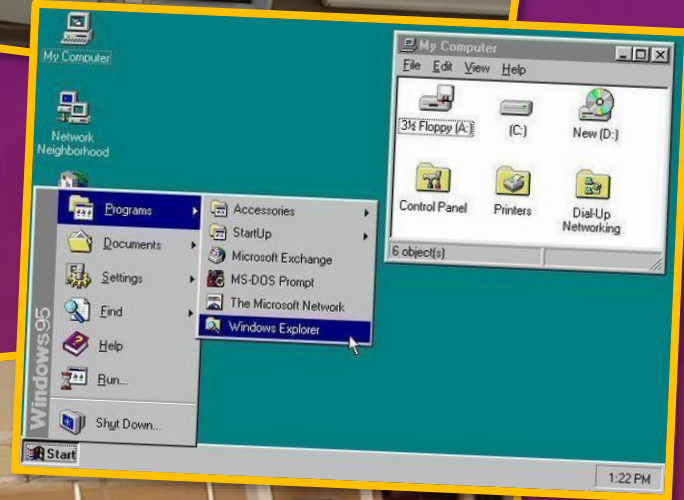
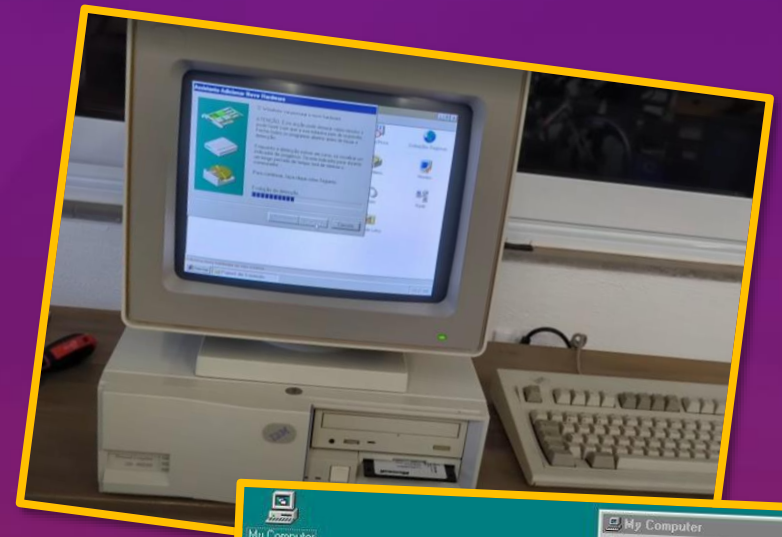
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THE BBC COMPUTER LITERACY PROJECT

By the mid 1990s, Acorn Archimedes machines were largely phased out, being replaced by hardware from companies such as IBM that ran **Windows** operating systems.

Windows PCs were slowly becoming more commonplace as the Internet was introduced to the general public, followed by **Apple's** first **iMac** in some sectors in the late 1990s.

Computers were also finding their way into people's **homes** as PCs (Personal Computers) around this time, becoming slightly more affordable and in demand, as the capabilities of computers started to expand for **entertainment** as well as work roles.





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Examples



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EXAMPLES

Teamwork and Social Development:

Moving Out

(SMG, 2020)

(Epic Launcher)

Critical Thinking:

*Mickey's Marvellous Mixture
Theme Park*

*(Selective Software, circa 1987)
(Bullfrog, 1994)*

*(BeebEm)
(GoG Galaxy)*



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Bibliography



BIBLIOGRAPHY

- [1] Crawford, C. (2003). *Chris Crawford on Game Design*. New Riders Publishing, USA.

- [2] Huleatt, H. (2018). Community Playthings. Role Play: Making Sense of the World. [Online]
<https://www.communityplaythings.co.uk/learning-library/articles/role-play-making-sense-of-the-world>
Accessed 3 Feb 2025

- [3] (No author). (2025). Ette Tete. *The Power of Roleplaying: Unleashing Your Child's Development Potential*. [Online]
<https://ettetete.com/blogs/news/the-power-of-role-playing-unleashing-your-child-s-development-potential>
Accessed 3 Feb 2025

- [4] O'Brien, R. (2025). University of Liverpool. *Using Games in Teaching*. [Online]
<https://www.liverpool.ac.uk/centre-for-innovation-in-education/resources/all-resources/using-games-in-teaching.html>
Accessed 27 Jan 2025



BIBLIOGRAPHY

- [5] (No author). (2017) CrashCourse. *Educational Games: Crash Course Games #15*. [Online]
<https://www.youtube.com/watch?v=ORSUg0C8qR8>
Accessed 5 Feb 2025
- [6] Kozlova, M. (2021). Cambridge English Language Assessment. *How do video games provide effective learning?* [Online]
<https://www.cambridgeenglish.org/blog/how-do-video-games-provide-effective-learning/>
Accessed 3 Feb 2025
- [7] (No author). (2025). Iberdrola. *The benefits of videogames in learning: Why your children really should play videogames*. [Online]
<https://www.iberdrola.com/talent/benefits-video-games-learning>
Accessed 3 Feb 2025
- [8] (No author). Sprouts Schools. *Video Games in Education*. [Online]
<https://www.youtube.com/watch?v=c5AN0JDmQY4>
Accessed 3 Feb 2025



BIBLIOGRAPHY

- [9] (No author). (2025). BBC Computer Literacy Project 1980-1989. [Online]
<https://clp.bbcrewind.co.uk/>
Accessed 31 Jan 2025
- [10] (No author). (2025). Centre for Computing History. *Widgit Software*. [Online]
<https://www.computinghistory.org.uk/det/65996/Widgit-Software/>
Accessed 5 Feb 2025
- [11] (No author). (2025). Centre for Computing History. *Anita Straker*. [Online]
<https://www.computinghistory.org.uk/det/47731/Anita-Straker/>
Accessed 5 Feb 2025



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