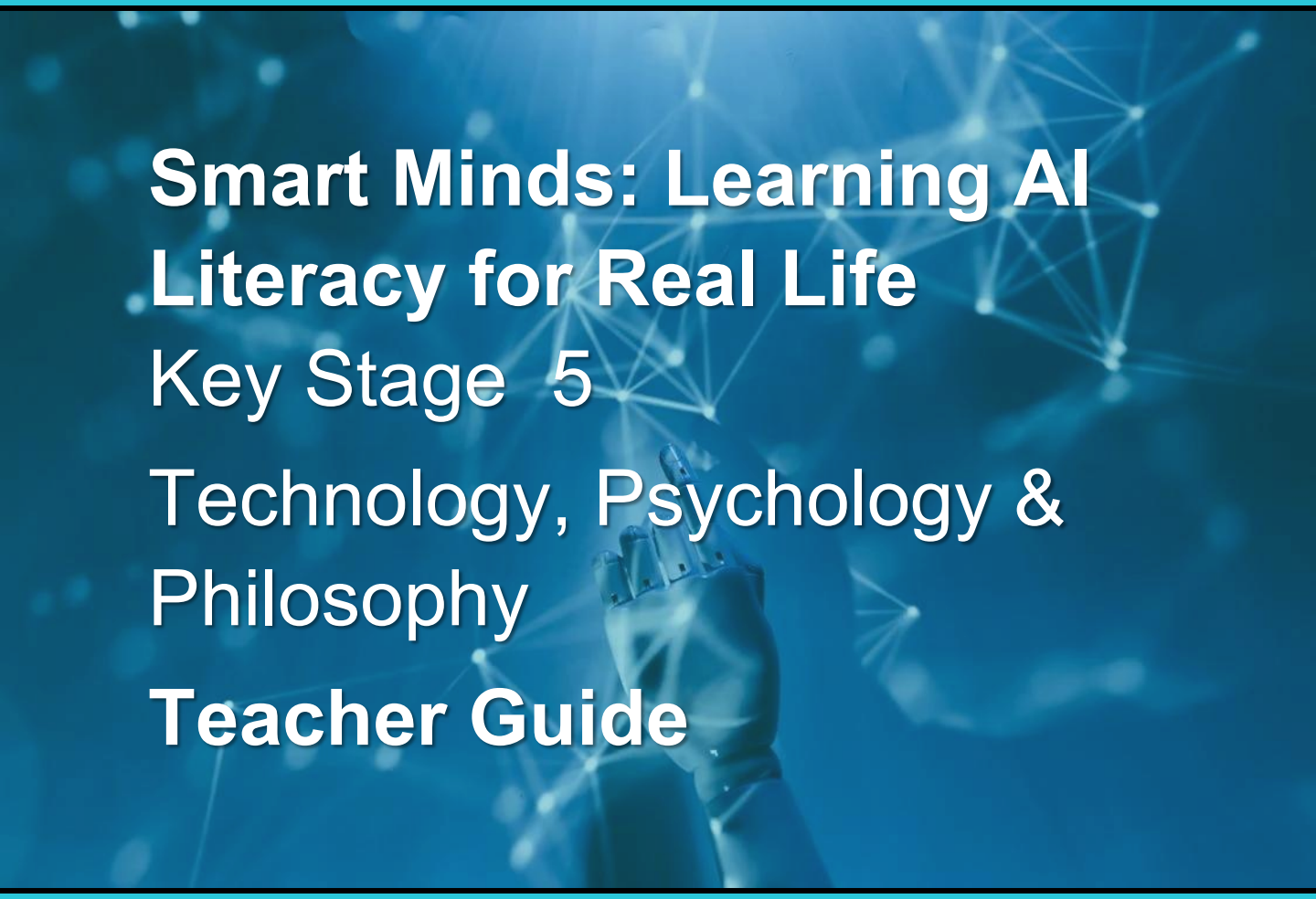
Research-Based Curricula



Smart Minds: Learning AI Literacy for Real Life

Key Stage 5

Technology, Psychology & Philosophy

Teacher Guide

2025

access ed

Building global university access programmes

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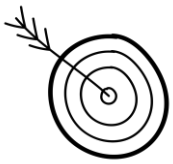
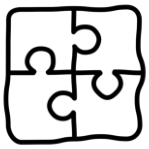


The Research-Based Curriculum is resources based on cutting-edge research, tailored for KS3, KS4 or KS5. The resources:

- *Support student attainment and progression*
- *Promote intellectual curiosity in students of all prior attainment*
- *Build understanding for more accessible 'stretch' beyond the curriculum*
- *Develop core academic skills that aid progression, including critical thinking, metacognition, and written and verbal communication*
- *Encourage students to see these subjects as engaging, worthwhile and inspiring for continued study*

Content



Each RBC pack contains 1) Six resources that function as subject 'lessons'; 2) Activities at the end of each resource for students to test their learning; 3) Further Reading links related to the subject; 4) Final Reflection Activity as the final assignment; and 5) Teacher Guide and model activity answers (this document).

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For Teachers

Using RBC packs

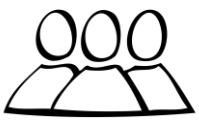
Suggested School Use

Teachers can use these resources flexibly. Students can complete the resources individually or in groups, in or out of the classroom. These packs help teachers:

- *Use research-based learning to engage whole classes, not just as a 'stretch' for the most able*
- *Support more students earlier in high academic achievement*
- *Improve all-school enrichment strategies by providing opportunities and resources*
- *Increase motivation and subject interest*

To do this, we encourage the 'supported use' approach. In other words, teachers provide some guidance and support to students in their independent use of the RBC packs.

Target Pupils



The RBC packs bring inspired subject learning to all students. These packs specially engage those students who might need extra support and encouragement and could benefit from engaging in the subject in a new way. The aim is that they are delivered with some teacher guidance to build the confidence of students as they complete a pack.

These packs build students' prior attainment rather than being offered only to those already academically able and motivated.

See more about delivery options on the following pages.

For Teachers

Using RBC packs

Delivery Options

To ensure all students can benefit from these materials, we recommend they are delivered with 'supported use.'

Supported Use means this resource is designed to be used partially with teacher introduction or instruction. While not marked, each chapter and the final reflection activity are set up so a teacher can help ease the students into the subject area or use the resource in class.

More ideas for using these packs in your school:

1. **Research Challenge**

The resources can ignite curiosity about new topics and encourage independent research. Schools could hold a research challenge across a class or year group to submit a work based on the resources. Pupils could submit individually or in small groups, with a final celebration event.

2. **"STEM", "Social Sciences" or "Arts & Humanities" Morning/ Day**

We know class time can be tight, so some schools 'launch' these packs and have students start them as part of a special subject day. This can be great for all-staff engagement too.

3. **After School Club**

The resources can be completed in small groups (4-8 pupils) across weekly lunch clubs or after-school clubs. Groups can reflect on their learning by presenting a talk or poster on the subject matter at the end of the course.

For Teachers

Using RBC packs

Delivery Options [cont.]

4. Classroom Debate/ Discussion if a written Final Reflection Activity isn't possible

Resource packs can function as 'transition' projects over the summer, serving as an introduction to the next level of study between KS3 and KS4, or KS4 and KS5. Students could present their reflections on the experience in a journal.

Model Answers

For each answer section, you have been provided with a 'model answer'. These are an example of the sort of answer a student might give to each question, although in many cases there may be multiple answers a student could give. These serve as a starting guide.

Each answer is linked to a question from the RBC.

Origin and Evaluation

The RBC programme builds on the University Learning in Schools programme (ULiS), which was successfully delivered and evaluated through the London Schools Excellence Fund in 2015. The project was designed in a collaboration between Achievement for All and The Brilliant Club, the latter of which is the sister organisation of AccessEd. ULiS resulted in the design and dissemination of 15 schemes of work based on PhD research for teachers and pupils at Key Stage 4 and 5.

LKMCo evaluated the project. Overall, pupils made higher-than-expected progress and felt more engaged with the subject content.

Resource One
Model Answers

Activity 1

Experiments with the AI chatbot Eliza can evoke a wide range of immediate thoughts and emotions. There are no right or wrong answers, just reflections.

- **Pros:** Some students may feel curious and intrigued by how the AI responds, appreciating the novelty and the chance to have a conversation with a machine. Others might experience surprise or amusement at the Eliza chatbot's simple yet sometimes too simple human-like replies. A few might feel talking to a real person.
- **Cons:** Some may feel frustrated by its limitations, such as repetitive or programmed answers, and recognise that Eliza cannot fully understand or empathise like a real person.

Overall, experimenting with Eliza offers an opportunity to explore the potential and the limitations of early AI, encouraging reflection on how technology can mimic human communication but also highlighting the importance of genuine human connection.

Resource Two
Model Answers

Activity 1

1. Yes. Siri is an AI technology that uses machine learning and natural language processing to understand voice commands. Siri can listen to your voice, learn from what you say, and improve over time. It can answer your questions without needing someone to type them every time.
2. No. A solar panel is not AI technology. It converts sunlight (photons) into electricity (voltage) through a process called the photovoltaic effect. It does not learn or make decisions.
3. No. Regular calculators use integrated circuits to follow a fixed set of rules to perform mathematical calculations. You press buttons to input numbers and operations. They do not learn, make decisions, or understand language like humans, and cannot adapt to new situations.
4. Yes. Self-driving cars use AI because they have sensors and learn from data to recognise their environment and make decisions, such as when to stop or turn. They can control the car without a human driver.
5. No. Basic alarm clocks are simple machines that ring, vibrate, or light up at a set time. They might use gears and springs (mechanical) or electronic circuits (digital) to keep time and sound the alarm. They do not learn or make decisions.

Activity 2

- Based on the video, **AI** is a technology that aims to enable computers to learn, reason, and solve problems in ways similar to human intelligence.
- **Machine Learning** is a type of AI in which computers learn from data, identify patterns, and use them to make predictions rather than being explicitly programmed.

Resource Two
Model Answers

Activity 2
(continued)

Deep Learning is a s type of machine learning that uses neural networks, which are designed to work like the human brain with many layers of processing. This helps the computer learn complex patterns and make better decisions.

Resource Three
Model Answers

Activity 1

There are no right or wrong answers, just reflections.

- **Pros:** The answers from AI Grok were more detailed and seemed more natural compared to Eliza's, which often gave short or repetitive replies
- **Cons:** The AI Chatbots do not really understand as humans do. Eliza mostly followed rules and programmed responses, such as matching keywords to canned answers. Grok uses machine learning and patterns from large datasets to predict responses, so it feels more advanced, but it still does not truly understand feelings or meaning.

Activity 2

Each AI has different strengths and purposes, showing how AI can be designed for varied tasks, from chat to coding assistance. There are no right or wrong answers, just reflections.

- **Pros:** Copilot is designed as a coding assistant. It generates suggestions for programming and understanding code, focusing more on technical language than dialogue.
- **Cons:** Copilot uses AI trained on lots of code examples for prediction, working more like an autocomplete for coding machines. It does not aim to be human-like in chat but is more focused on its coding domain, offering code suggestions to users.

Activity 3

There are no right or wrong answers, just reflections.

AI is great at quickly finding information, but sometimes it gives wrong or confusing answers. They learn a lot of information online, and sometimes that information is inaccurate or one-sided.

Resource Three
Model Answers

Activity 3 *(continued)*

AI can make mistakes and even make up answers that sound real but are not true. It is called “hallucinations”. Therefore, it is important to check AI’s responses against trusted sources and to think critically and exercise human judgment when using AI.

Activity 4

There are no right or wrong answers, just reflections.

Using AI to explain difficult text can make learning easier by breaking complex ideas into simpler terms that students can understand. AI might also provide additional information, including sources, to help students learn from different perspectives and in depth, something textbooks don’t always do. However, AI is just a technology, and it depends a lot on how students ask questions and interact with it to make learning personal and effective.

Resource Four
Model Answers

Activity 1 There are no right or wrong answers, just reflections.

1. AI receives your sketches by turning them into numbers and patterns it has learned from many other images. It compares your sketches to these patterns to understand what you want.
2. The AI model needs to have learned many examples and connections between sketches and finished images so it can predict the possible matching design based on what it has learned.
3. Potential benefits include saving time, being easy to operate, and allowing easy experimentation.
4. Potential risks are that AI can sometimes copy existing styles too much, make mistakes, or create designs that lack real creativity or a personal touch.
5. AI can learn new patterns when trained with more data, but it can also make mistakes if it does not have enough variety and diverse examples.

Resource Five
Model Answers

Activity 1

There are no right or wrong answers, just reflections on creativity and ownership as we explore AI music creation.

1. Students feel surprised or excited because the AI-generated music may sound like something a human would create, with emotions and style. However, some might feel it sounds different or unnatural.
2. Suno AI creates music by using a large collection of songs and sounds to learn patterns of melody, rhythm, lyrics, and styles. It processes your text prompts to decide what kind of music to make based on this learned data. It is important to note that AI does not obtain consent from artists and singers before using their work, which is a significant concern.
3. Knowing that AI collects your text prompts automatically, even without explicit permission, might feel worrying or uncomfortable. It indicates that your ideas are stored and may be used for training. It raises questions about privacy and control over your creative input.
4. Copyright ownership of AI-generated music can be complicated because the music is created using data from many sources. This challenges traditional ideas of creativity, ownership, and how artists earn money. Some AI platforms offer free (Basic) and paid accounts. With a premium account, the AI companies claim that you own the AI-generated songs you create and can distribute them commercially, such as on Spotify. Ownership depends on your subscription and the platform's terms, not just on who created or inspired the music. However, full copyright protection may not yet apply, as laws governing AI-generated works are still evolving.

Resource Six
Model Answers

Activity 1

There are no right or wrong answers, just reflections.

1. Deepfake is a type of AI technology that creates fake videos, images, or voice recordings that look and sound real. It can place someone's face or voice onto things they did not actually say or do. Sharing personal photos or voice recordings with AI tools can be risky, as they might be used to make fake content without permission.
2. Once data is uploaded, it can be copied, stored, or shared many times in different places. AI systems often retain this data to learn and improve, making it very difficult to delete it later.
3. Caution should be taken when sharing photos, videos, or voice recordings online. Adjusting privacy settings, reading terms of service, and using trusted AI tools help protect privacy. Sensitive personal information should not be shared.
4. AI tools should be clear and honest about how personal data is collected, stored, and used. Transparency allows individuals to make informed choices about sharing information, builds trust, and protects privacy from misuse.

Activity 2

There are no right or wrong answers, just reflections.

Creating a deepfake is surprisingly easy and fast. This AI tool enables almost anyone to produce deepfakes without special skills or equipment. People might misuse deepfake technology to create fake news, spread rumours, bully, or damage someone's reputation. This can cause harm and mistrust in society. Ethical use and critical thinking are essential.

Resource Six
Model Answers

Activity 3

There are no right or wrong answers, just reflections.

1. Finland treats AI literacy as civic education, teaching citizens to understand AI's principles and ethical implications. Ghana treats AI literacy as vocational training, teaching students to apply AI tools to local problems like farming and healthcare.
2. Finland uses unplugged games, physical models, and free courses. Ghana uses project-based learning, no-code platforms, and mobile apps to build solutions to community challenges with support from tech hubs.
3. Finland's activities focus on the process of understanding, questioning, and ethical reflection. Ghana's activities focus on outcome: building, solving, and deploying practical applications.
4. Finland's egalitarianism drives privacy-focused, human-centred regulation with strong teacher autonomy. Ghana's communal values encourage flexible, innovation-friendly policies prioritising access and collective progress.
5. This depends on your country's specific context, infrastructure, and cultural values. However, it is generally recommended to blend Finland's unplugged conceptual lessons with Ghana's project-based problem solving. Use no-code platforms, mobile-first tools, and locally trainable open-source resources to ensure relevance and accessibility.

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