

# INTEGRATION OF CIRCULAR ECONOMY PRINCIPLES IN STEM EDUCATION

## CIRCULAR STEM ACADEMY – A FLEXIBLE AND SCHOOL-FRIENDLY SOLUTION

The Circular STEM Academy offers a flexible, scalable, and school-friendly solution for embedding circular economy principles into STEM education. Developed through international cooperation and validated by practicing teachers, the project's outputs deliver both pedagogical depth and practical value. The Toolbox and training modules empower educators to implement innovative, sustainability-oriented teaching approaches, contributing to the development of environmentally responsible and digitally skilled students across Europe.

Circular STEM Academy Moodle platform: <https://tinyurl.com/circularstem>



## High-quality digital learning environment

The Circular STEM (Boosting Circular Economy Competences for STEM Teachers) project, focused on enhancing circular economy competences in STEM education, has resulted in the creation of a high-quality digital learning environment, tailored to the needs of teachers and schools across Europe. It includes:

- A structured Moodle-based platform
- Six training modules
- An extensive Toolbox of teaching and learning resources



The Circular STEM Academy is based on six comprehensive learning modules that provide a step-by-step introduction to circular economy topics and their implications for STEM education:

1. Introduction to Circular Economy
2. Environmental Sustainability and Impact
3. STEM in Circular Economy
4. Digital Literacy and Tools in Circular Economy
5. Circular Economy Challenges and Projects
6. Career Paths and Future Trends

Each module is supported by carefully selected resources, activities, and multimedia content that promote active learning, critical thinking, and interdisciplinary connections. These modules are hosted on a user-friendly Moodle platform, enabling flexible access for teachers and learners.



Complementing the modules is the Circular STEM Toolbox - a core resource offering over 80 tools and materials. The Toolbox is divided into five main thematic sections, each aligned with specific learning objectives:

- Educational Materials and Guides
- Interactive Activities and Challenges
- Creative Projects and Games
- Multimedia and Policy Tools
- Additional Resources and Case Studies





## Ensuring quality, usability, and relevance

The platform and its resources underwent two structured testing phases - Alpha and Beta - to ensure quality, usability, and relevance.

During the Alpha Test, conducted by internal project staff across six partner institutions, teachers evaluated the platform's design, content, interactivity, and overall usability. They praised the logical structure, rich selection of resources, and ease of navigation.

Recommendations included improvements of font sizing, mobile compatibility, forum accessibility, and the visibility of interactive components. This feedback directly informed refinements to the platform.

The Beta Test involved 15 external teachers across three partner countries who had not previously engaged with the project. Their evaluations were overwhelmingly positive, with most scoring the platform and materials between 8 and 10 out of 10 across all categories. Teachers appreciated the clarity, practicality, and alignment of the content with school curricula.

Suggestions included adding a visual map of resources and improving document viewing functionality. The balance of theory and practice in the toolbox, especially the inclusion of games and challenges, was particularly well received.

While the main language of delivery is English, feedback from participants highlighted the need for multilingual support and simplified navigation to enhance accessibility, particularly for non-native speakers and mobile users. These improvements are currently under review for the platform's final release.



## Integration of digital tools and inclusive approach

A core strength of the Circular STEM Academy platform is its integration of digital tools and inclusive practices:

- The Moodle environment supports independent, self-paced exploration
- Videos, quizzes, simulations and forums promote engagement
- Materials are designed to accommodate diverse learner profiles and teaching contexts
- Special attention is given to accessibility, screen readability, and device compatibility

The overall methodology is learner-centred, encouraging active participation in classroom activities while making effective use of digital tools.