West Kirby School and College STEM Strategy

Intent

At West Kirby School and College, we are committed to providing exciting opportunities to all our pupils that inspire curiosity and develop solution seeking, innovative thinkers who are confident with their technical skills, recognise the contribution they can make to the wider community by developing a growth mindset and have science capital in abundance.

Science capital is the science-related knowledge, attitudes, experiences and social contacts an individual may have. For our pupils, the more science capital they have and the greater the value placed on their science capital– the more likely they are to engage in STEM subjects or activities and recognise careers in STEM as a realistic option.

A growth mindset is the belief that skills and talents can be developed through hard work, the right strategies and guidance from others. By providing a wide range of new opportunities to our pupils and enabling them to recognise mistakes and trial and error form part of the learning process STEM is a vital part of promoting the shift from a fixed to a growth mindset.

Implementation

We are able to do this through an aspirational and robust curriculum and our STEM strategy.

Our STEM subjects are:

- Science
- Design Technology
- Food Technology
- Engineering and Design
- Maths
- Creative iMedia
- ICT
- Computer Science

STEM also collaborates with the Creative Arts Department in school to provide STEAM activities and events.

As part of our STEM strategy all pupils at West Kirby School and College will have the opportunity to:

- Experience high quality teaching from specialist subject teachers in STEM subjects
- Follow a well-planned curriculum that builds on developing knowledge, understanding, digital literacy and technical skills in STEM subjects with cross-curricular links explicit
- Take part in STEM related extra-curricular clubs, either at lunchtime or after school
- Participate in national or regional STEM competitions and projects

- Take part in termly Discovery Days – designed to inspire, develop the STEM strands and put STEM subjects into real-life contexts
- Complete CREST awards
- Use up-to-date and emerging technology across STEM subjects to enhance their learning, understanding and skill level
- Take part in external STEM trips to places such as museums, universities, industry
- Explore the important role STEM plays in sustainability and protecting the planet
- Contribute to sustainable STEM projects in school and the local community
- Meet and work with STEM professionals from a wide range of industries and backgrounds
- Explore STEM related careers
- Share their STEM related experiences with others and be encouraged to “talk STEM”

Impact

The STEM Strands are the WKS identified priority skills that run through all our STEM subjects. The skills are broken down into hierarchical statements so progression through each skill area can be seen.

The STEM Strategy Annual Overview clearly shows how the elements of the STEM strategy have been implemented across the year for each year group. The STEM staff team meet half-termly to plan and review the activities and opportunities in place.

Pupil and staff questionnaires are used to monitor pupil engagement in activities. Progress data from the STEM subjects is used to monitor attainment in each STEM subject area.

References:

Godec, S., King, H. and Archer, L. (2017) The Science Capital Teaching Approach: engaging students with science, promoting social justice. London: University College London

Dweck, C. S. (2006) *Mindset: The new psychology of success*. Random House

STEM Strands

Problem Solving	Research	Critical Reflection	Communication	Technical Skills	Digital Literacy
Select a problem from a choice to investigate	Use given sources to select relevant information	Identify what has gone well	Ask for help and advice	Make predictions based on knowledge and understanding	Stay safe and act appropriately when online
Follow a given procedure to investigate a problem	Identify a range (3-5) of sources to gather information	Identify what has not gone well	Share findings verbally with peers	Use given simple equipment to follow a procedure taking account of health and safety	Identify the correct digital technology, tool and technique to use for a task
Select a potential solution from a range of suggestions	Use information gathered from research to inform how to approach a problem	Suggest reasons for what has gone well	Work collaboratively and discuss findings with peers	Clear, clean and dispose of equipment and products taking account of health and safety	Browse, search and filter digital information and content
Identify a problem in a real-life context	Recognise the benefits of researching information	Suggest reasons for what has not gone well	Prepare and share results in a visual format – e.g. diagrams, graphs	Make and record observations and measurements using a range of methods	Communicate ideas and information using a range of digital technologies, tools and technology
Develop an action plan to investigate a problem	Use information gathered from research to validate own results	Interpret observations and data, including identifying patterns and drawing conclusions	Prepare and share results in a written report	Select the most appropriate simple equipment to use from a range to follow a procedure taking account of health and safety	Recognise and adhere to the restrictions and protection afforded by copyright and licences when using digital technologies, tools and techniques
Think creatively to identify potential solutions	Use a range of research tools to gather new information	Identify ways to improve procedures or outcomes	Prepare and share results in a presentation	Select and use complex equipment to test a prediction taking account of health and safety	Recognise how to protect digital devices and personal digital data
Work methodically to select and reject potential solutions	Identify trustworthy sources of information	Identify further questions from results	Prepare and share results using multimedia technologies	Complete a risk assessment independently for a process or procedure identifying ways to mitigate risk	Develop and create original digital content using a range of technologies, tools and techniques

STEM Strategy Annual Overview

Year Group	Term	Extra-curricular clubs	National/regional competitions/activites	Discovery Days	CREST awards	Use of emerging Technology	External STEM trips	Sustainable STEM projects	STEM professional visits	Careers input
Primary	Autumn									
	Spring									
	Summer									
Year 7	Autumn									
	Spring									
	Summer									
Year 8	Autumn									
	Spring									
	Summer									
Year 9	Autumn									
	Spring									
	Summer									
Year 10	Autumn									
	Spring									
	Summer									
Year 11	Autumn									
	Spring									
	Summer									
Year 12	Autumn									
	Spring									
	Summer									
Post 16	Autumn									
	Spring									
	Summer									