

STEM Strategy

Training the talent of today for the world of tomorrow

**A commitment to developing Science,
Technology, Engineering and Mathematics
across Fife**

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Introduction

Demand for STEM skills is particularly strong. These skills underpin innovation and are critical to the UK's ability to compete successfully in high-value, high-growth sectors. The CBI surveys show that businesses are encountering difficulties in recruiting people with STEM skills at every level, from new entrants to train as apprentices, to people with more than five years' experience of STEM-related work. Employers' views and priorities around skills – particularly STEM – are clearly shown from their survey results:

- Changing technologies and markets demand rising levels of skills.
- Demand for skills will be strongest in sectors essential for rebalancing, but businesses are concerned that the demand for skills cannot be met.
- People with STEM skills are becoming particularly hard to recruit, and businesses expect these difficulties to intensify.
- The STEM crisis can only be addressed by business and education working together, but government also has an important role to play.

National Context

The Scottish Government's STEM Education and Training Strategy for Scotland is the driver for Fife College and Fife Council to refresh their STEM strategy and action plan, adopting an integrated and coherent vision that is outward focused and drives economic growth and prosperity. Throughout this process, our aims are to ensure STEM provision:

- Is of the highest quality and drives excellence across Fife.
- Produces skilled, work-ready, enterprising, digitally fluent and employable students.
- Generates productive partnerships and relationships with business and local industry.
- Supports the current and future skills needs of the local, regional and national economy.

This strategy gives students, staff and stakeholders an overview of the vision we have created and makes specific pledges which we will implement over the coming months and years. This strategy ensures Fife College and Fife Council plays a key and pivotal role in meeting the needs of STEM and related employers in the region and surrounding areas and will inform the college's planning decisions until 2022, a five-year plan which will be re-evaluated on a one-year cycle.

“Developing Scotland’s STEM talent is key to achieving our ambitions of being a modern, dynamic and open economy. Our goal is to connect education and training to the needs of the employers to deliver an excellent workforce, both now and in the future. Colleges have an important role in strengthening regional collaboration between partners, including universities, science centres and employers as well as with schools and community and early learning.”

Shirley- Anne Somerville MSP, Minister for FE, HE and Science, February 2018

Working together our strategy and plans have been and will continue to be shaped by all partners in the region: Fife College, Fife Council, local industry, schools and universities, who all share our ambition and determination to realise this shared vision.

Regional Context – Fife Economic Strategy 2017-2027

Fife will focus its economic development and employability efforts on supporting the following key sectors:

- Energy and Renewables
- Manufacturing
- Finance and Business Services
- Tourism
- Food & Drink
- Health and Social Care
- ICT
- Construction

While it is difficult to accurately predict the future direction of the economy and the labour market, we can be confident that higher level skills and knowledge of STEM will be increasingly important in the years ahead.

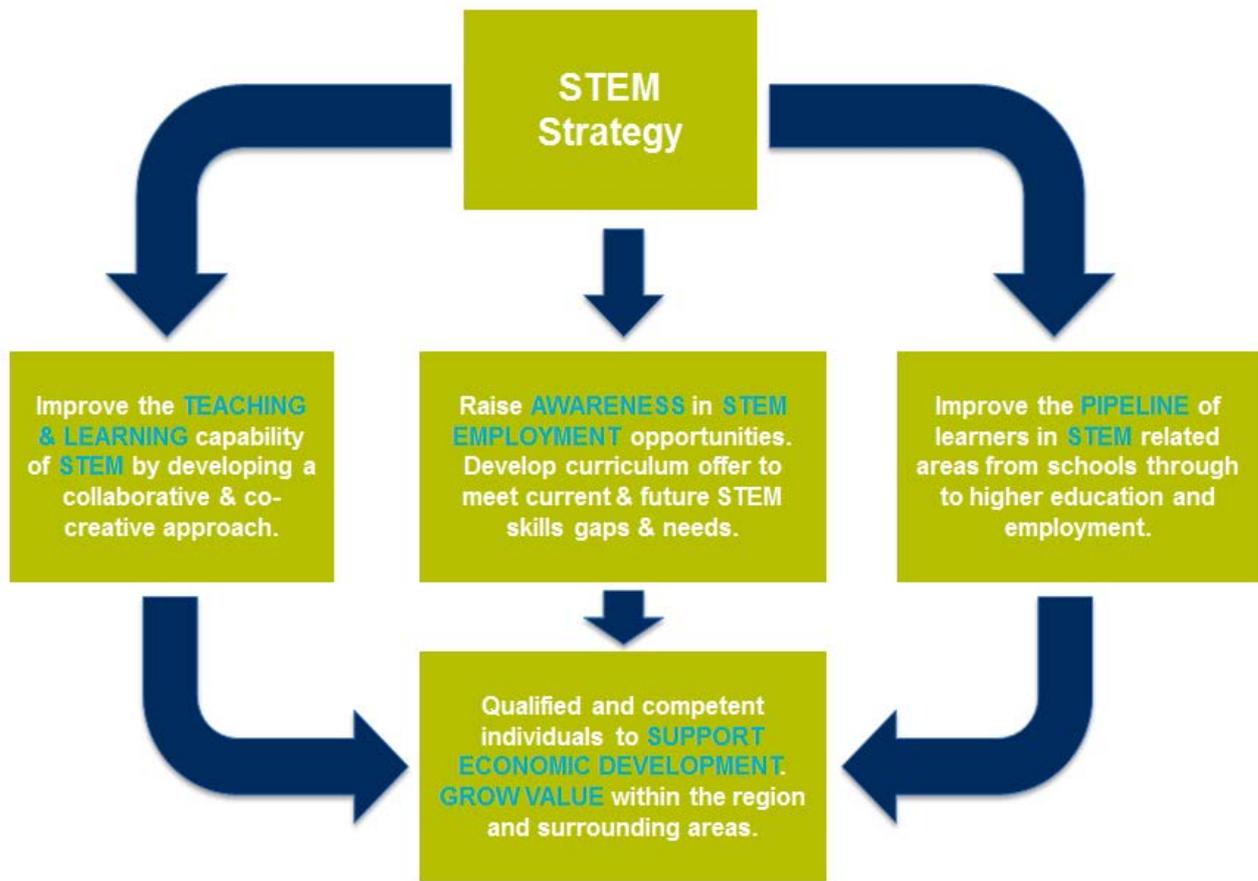
Fife's Economic Strategy mirrors Scotland's Economic Strategy's four key priorities for sustainable economic growth. With regard to the regional STEM agenda Fife has committed to supporting Scotland's key sectors and fundamental to this strategy is the **“acceleration of Fife's STEM Strategy.”**

Within their strategic partnerships, Fife Council's Education and Children's Services Directorate and Fife College have made STEM a priority within their plans to develop vocational pathways and to deliver learning that is directly relevant to getting a job, as a mainstream option for all pupils in the senior phase of secondary school.

In doing so, we hope to address gender imbalances in learning, and contribute to a significant reduction in youth unemployment by ensuring that what is on offer is relevant to labour market needs and addresses the needs of STEM.

STEM Strategy

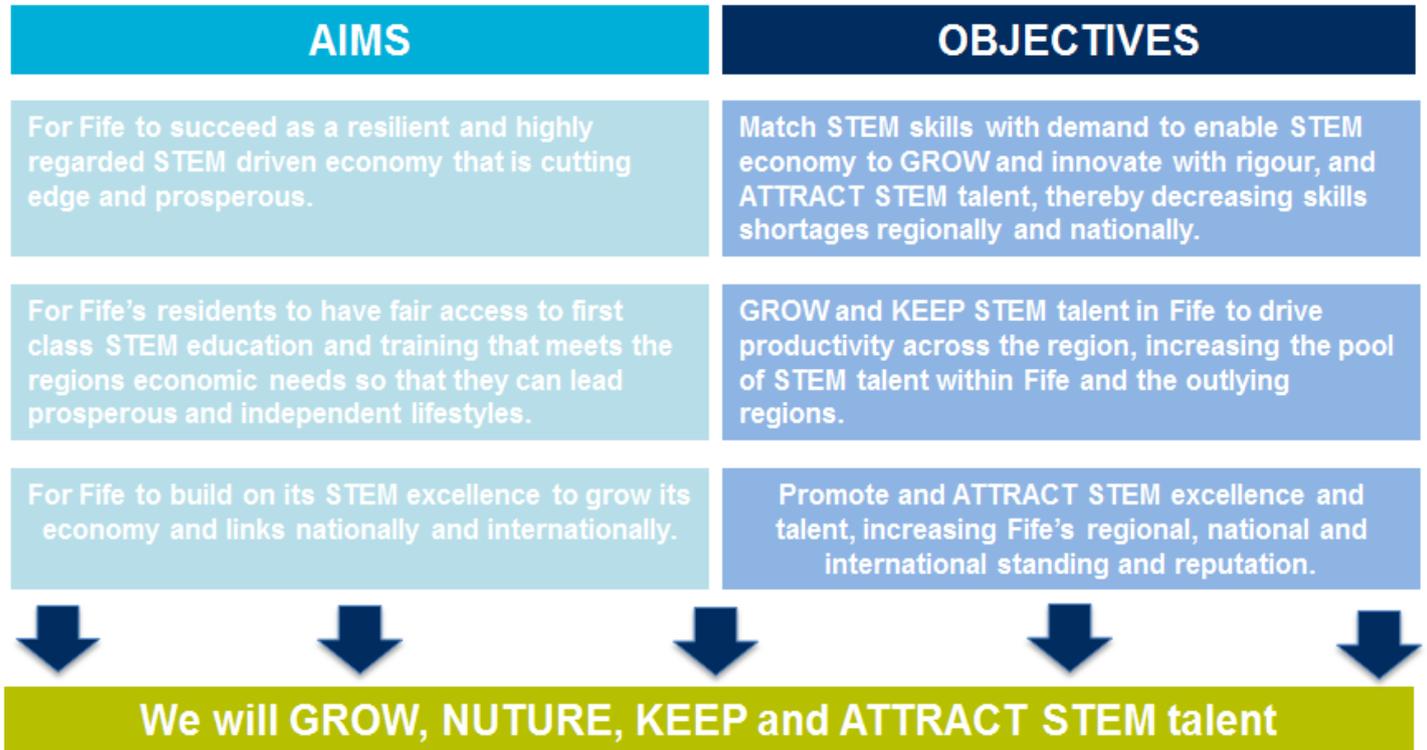
The Scottish Government's STEM Education and Training Strategy for Scotland October 2017, Fife's Economic Strategy 2017-2017, DYW Fife and the Government's "Developing the Young Workforce: Scotland's Youth Employment Strategy" December 2014 all make reference to the STEM skills gaps. These documents and sector leading groups are all key enablers in the quest to formulate workable and sustainable solutions to this lack of knowledge and skills students have in STEM related subjects prior to moving into employment. Cognisance of STEAM has been factored into our STEM Strategy; however the UK and Scottish government's priorities, at local and national levels, are the STEM agenda and regional strategies and commitment to resolve this UK wide issue. These aforementioned issues have a serious and detrimental impact on regions and countries, current and future, economic growth and development. We will address these with the following model.



The STEM Strategy provides a robust framework, a clarity of purpose and a coherent approach to the provision. Importantly, the STEM strategy strengthens existing provision and provides the college with the capability to deliver education and training in new and emerging technologies that meets the needs of key regional and national industry sectors, preparing students for jobs that do not currently exist. The STEM strategy is an evaluative process which enables the college to effectively identify demand in key sectors and to assess the suitability, scalability and sustainability of existing and new provision.

Aims & Objectives

Our vision is that by 2027, Fife will be a thriving and innovative region with Science, Technology, Engineering and Mathematics (STEM) driving the region's growth, productivity and future sustainability.



Pledges

We have a responsibility to support the economy across the region with staff that possess the right knowledge and transferable skills to meet labour market needs. It is these duties that the STEM strategy and pledges are designed to address.

Our focus over the next 5 years is manifested in the following pledges which support our commitment to foster a culture of entrepreneurship, innovation and enterprise in STEM. We will:

- Commit to building a strong STEM capability for the regional economic priorities, particularly emerging and high value industrial and commercial sectors.
- Ensure that STEM is given prominence and status across the College, Council and the community.
- Create an education and training environment that delivers the best in STEM learning and teaching at every stage of lifelong learning and development.
- Promote, support and deliver STEM progression and careers through close collaboration between Fife College, Fife Council Education and Children's Services Directorate, partner universities, employers and other stakeholders.
- Provide the capacity and capability in STEM to enable employers to meet business objectives and the Council's economic priorities.
- Contribute to raising levels of STEM numeracy, literacy and employability skills across the region.
- Build understanding, knowledge and expertise of STEM subjects with staff to support a sustainable portfolio of provision across all College faculties and schools.
- Take a lead role in the region and wider industries to raise awareness and attract under-represented groups, such as women, into STEM related industries and education.

Outcomes & Impact

Aligned to Key Performance Indicators, the STEM Strategy is aimed at **getting the right people in the right place with the right skills**. This requires Key Performance Indicators that measure against our Economy, Education and Region.

In addition to operational and strategic measures for Fife College and Fife Council, progress and impact will also be measured relative to other regions within Scotland which have similar industrial structures and similar strengths in relation to STEM sectors.

All information will be reported on through the regional STEM strategy group which will be jointly chaired by Fife College and Fife Council Education and Children's Services Directorate.

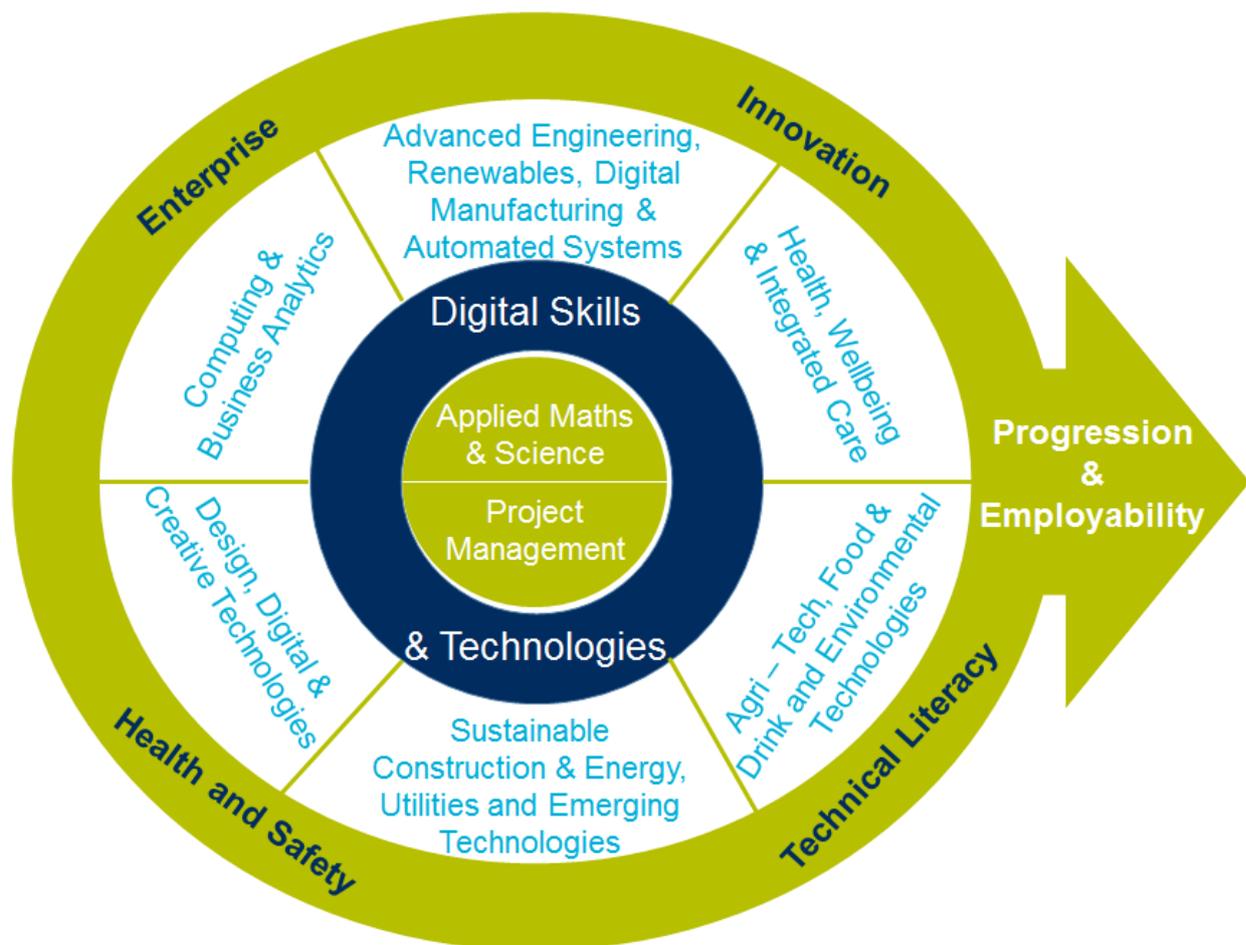
<p>Confident Fife</p>	<p>Economic Outcomes</p>	<p>Economic Measures: STEM supply and demand Industrial specialism in STEM STEM earnings STEM employer feedback and data</p>
<p>Growing Fife</p>	<p>Educational Outcomes</p>	<p>Educational Measures: STEM enrolment and attainment STEM progression and destinations STEM outcomes and gaps</p>
<p>Caring Fife</p>	<p>Regional Outcomes</p>	<p>Regional Measures: STEM awareness and understanding STEM access and participation STEM satisfaction</p>

Delivery of the Strategy

The STEM strategy identifies specialist curriculum clusters where Fife College and Fife Council Education and Children's Services Directorate can develop competitive advantage. These provide a clear framework to signpost, strengthen and progress existing STEM provision. These will also help us to develop the capability to deliver new education and training in emerging technologies to meet the needs of the local industry. Underpinning all of these will be the development of Applied Mathematics, Science, Project Management and cross cutting themes of Innovation, Enterprise, Health and Safety, Technical Literacy, Progression, Employability and Digital Skills and Technologies.

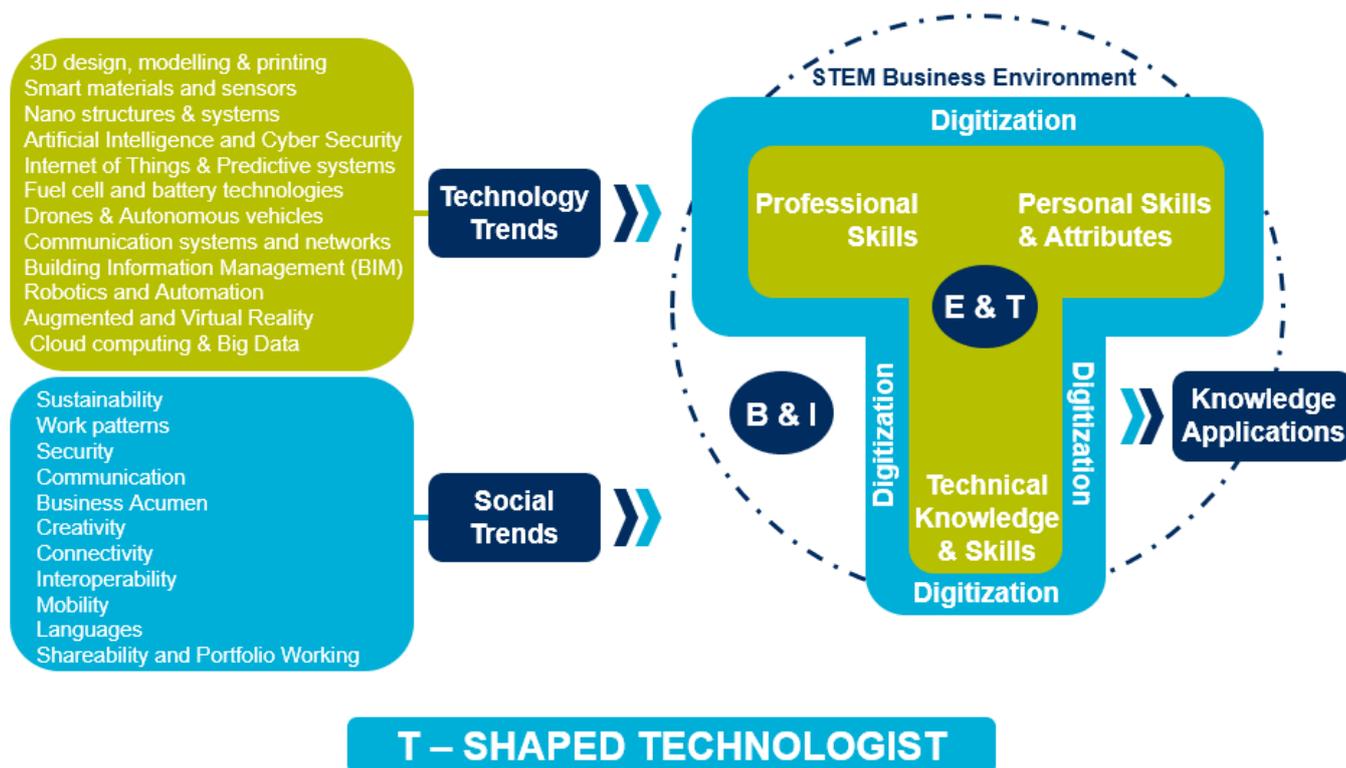
The STEM strategy identifies the competitive advantages as:

- Advanced Engineering, Renewables, Digital Manufacturing & Automated Systems.
- Design, Digital and Creative Technologies.
- Computing and Business Analytics.
- Sustainable Construction and Energy, Utilities and Emerging Technologies.
- Health, Wellbeing and Integrated Care.
- Agri-Tech, Food and Drink & Environmental Technologies.



The Future of STEM Skills

A roadmap approach to STEM skills development is needed to anticipate in a timely manner the skills shortages and future needs. The proposed T2K (Trends to Knowledge): STEM Skills Road Mapping model envisages a collaborative approach that operates as an ecosystem, bringing together education and training providers with business and industry, to assess technology and social trends in order to predict and guide the development of new knowledge and STEM related skills provision as shown below.



It presupposes the need to develop T-Shaped skills and competencies in students and learners in a balanced way that combines discipline-specific technical knowledge with professional and personal skills and attributes (T-Shaped Technologist report, STEM Foundation 2014). It also assumes a shared responsibility between education and training providers, and business and industry to identify new and emerging trends to anticipate and thus, update the STEM education and training provision.

This is the model the strategy plans to expand into all curriculum areas through the implementation of the STEM Action Plan, building review points in the evaluation process to ensure STEM skills are integrated into everything the STEM partnership does.

Economic Context

In 2017, Fife had 10,105 enterprises employing 165,400 people. These enterprises generated turnover of £12.9 billion. (source: Scottish Government)

Fife's top three largest employing sectors are Wholesale, Retail & Repairs, Manufacturing and Education, Human Health & Social Work Activities. (source: Scottish Government)

Manufacturing remains an important sector for Fife having generated the highest turnover of out of all sectors at £3.9 billion in 2017. (source: Scottish Government)

“The Scottish Government STEM strategy and the presence of the University of St Andrews, imply the existence of an intellectual capital and the opportunities to create higher level jobs. There is a forecast increase in jobs in the higher value added professional, scientific and technical sector services, and in information and communications, and these are drivers of future GVA growth”. (source: SDS Regional Skills Assessment 2017)

The professional, scientific and technical sector in Fife is made up of 1,810 enterprises, employing 6,260 people and generates £479 million. (source: Scottish Government)

The information and communication sector in Fife is made up of 565 enterprises, employing 3,810 people and generates £193 million. (source: Scottish Government)

In 2016, there were approximately 51,000 people employed in **STEM-related industries** in Fife. (source: ONS Business Register & Employment Survey)

Economic forecasts predict a 53.5% increase in GVA in Fife's Information and Communication sector from 2017 to 2037. (Source: Fife Business Base report 2017)

Demand for skills in Fife: professional occupations are forecast to have the highest levels of total requirement (16,100 people). The requirement for Professional occupation is driven by teaching and research professionals (7,300 people) and science and technology professionals (3,600 people). (source: SDS Regional Skills Assessment 2017)