



**SAXAVORD**  
UK SPACE PORT



# EDUCATION STRATEGY

September 2022

## **Abstract**

*To strengthen the link between space and society by ensuring that everyone is inspired by space to learn STEAM subjects to tertiary level, creating a skilled and enthusiastic workforce for space.*



# FOREWORD

It is a pleasure to introduce the SaxaVord Education Strategy as chair of the Shetland Space Education, Employment and Skills Pipeline (SSEESP) working group. SSEESP, formed in March 2021, brings together representatives from local schools and the wider education sector, University of Highlands and Islands (UHI) Shetland, local training providers and businesses, Developing the Young Workforce (DYW) and a range of other partners to ensure all of our children and young people capitalise, during their school careers and beyond, on the exciting developments and opportunities in the space industry that SaxaVord Spaceport will provide.

We have worked closely with SaxaVord Spaceport since the inception of SSEESP, establishing terms of reference and planning, jointly, opportunities for children and young people, including their engagement with an astronaut teacher, the establishment of space camps and participation in national spaceport competitions.

In 2022/23, SSEESP is prioritising developing apprenticeship opportunities within the local space industry and relevant ancillary industries, space competitions, hackathons, clubs, ambassadorships and other space-related initiatives in schools; also local space-themed days, events, visitors and speakers, ensuring representation of the space industry at local employment events and establishing a progressive curriculum programme linked to space.

The SaxaVord Education Strategy is a further, hugely important step important forward, aligning with the aims and aspirations of the SSEESP, and reflects the value and commitment of SaxaVord Spaceport to promote educational opportunities and skills development.

I very much look forward to supporting the implementation of the strategy.



**Robin Calder**

*Executive (Director)  
Shetland Islands Council*

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# BACKGROUND

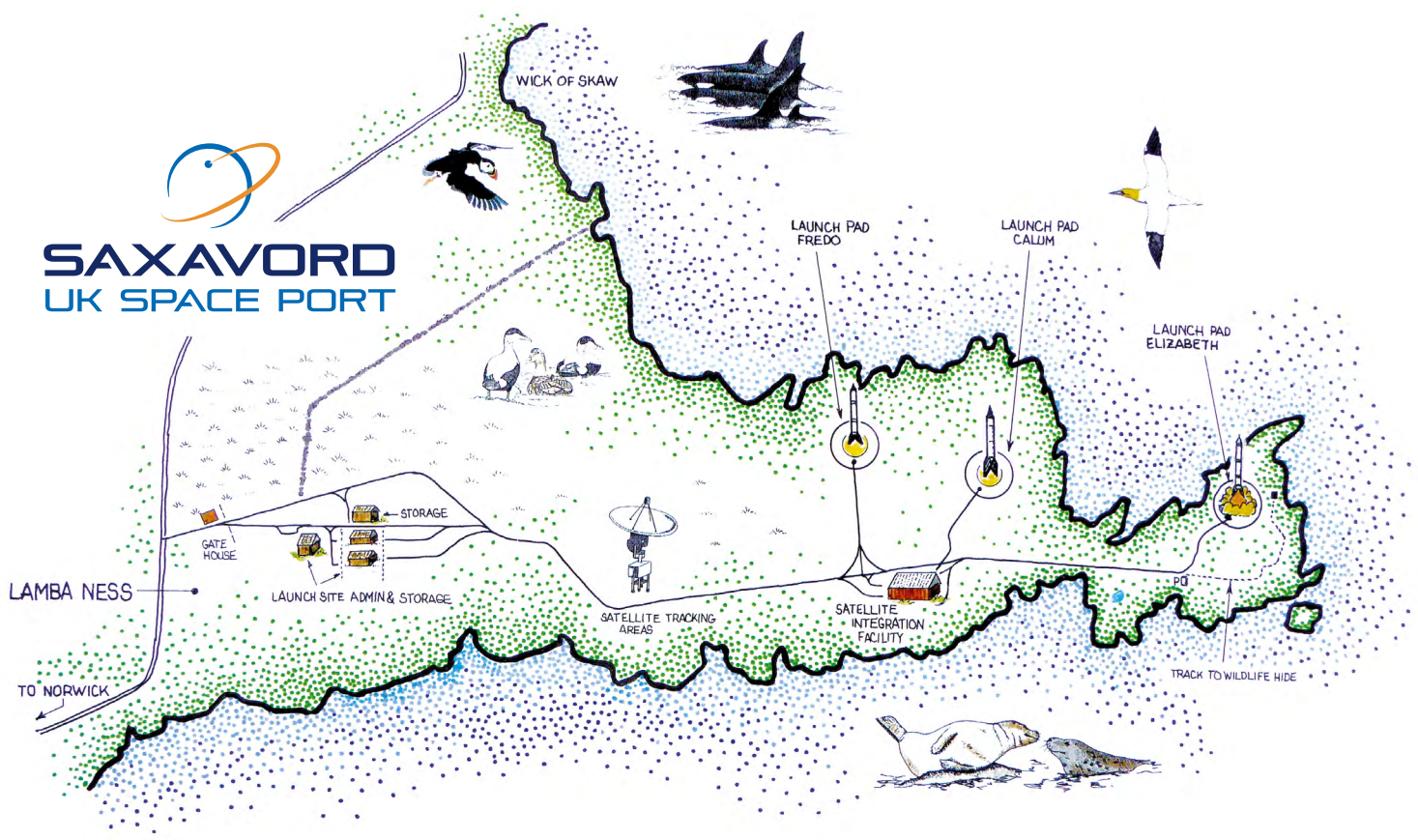
**SaxaVord Spaceport (SAXA) is the United Kingdom's premier, multi-user vertical launch site, offering the most direct route to polar and sun synchronous orbits in Europe.**

Situated at the most northerly tip of the United Kingdom, in the island of Unst, Shetland, SAXA provides both launch and ground station facilities for a range of US, European and British satellite and launch providers.

Its strategic positioning means it has the ability to offer competitive pricing due to its direct access to orbit over the Northern Atlantic.

SAXA's geographic advantage and growing network of ground stations allows for multiple data downloads each day, providing the infrastructure needed to support data-driven industries and society.

SAXA is a privately-owned launch site which when complete will have three launch pads and the ability to offer 30 vertical launches a year.



# SAXAVORD SPACEPORT VISION

To strengthen the link between space and society by ensuring that everyone from one to 101 is inspired by space to learn about science, technology, engineering, arts and mathematics (STEAM) subjects to tertiary level, creating a skilled and enthusiastic workforce for space.

Building on the work of the UKSA, this addresses two distinct but related issues:

- 1) Space has demonstrated a remarkable power to inspire widespread interest and curiosity in STEAM and provides exciting contexts for the teaching of a range of subjects.
- 2) A gap in the growth of the space sector is hampered by the scarcity of UK graduates and technicians with relevant skills and qualifications in aerospace.

# EDUCATIONAL MISSION

Space, maximising the educational, environmental and societal benefits for the UK while caring for the environment and promoting a skilled and diverse workforce. According to the UK Government's National Space Strategy<sup>1</sup> (September 2021), New Space<sup>2</sup> and the commercialisation of space present a significant opportunity: the global space economy is projected to grow from an estimated £270 billion in 2019 to £490 billion by 2030<sup>3</sup>. Space Scotland is targeting a £4 billion share of the global space market and 20,000 jobs in the sector by 2030<sup>4</sup>.

Drawing on the strengths of our growing network of peers and partners across industry, government and academia and our commitment to the diversity of roles offered, SaxaVord Spaceport will work with the global space community to provide solutions for Scottish, UK and international clients as well as complementing space domain policy for Education, Innovation, Technology and Sustainability (EITS). We will facilitate new business and industry growth within Shetland and beyond while enhancing our growing reputation for dynamic innovation and competitiveness in cutting-edge research, educational collaboration and youth workforce development.

# PARTNERS

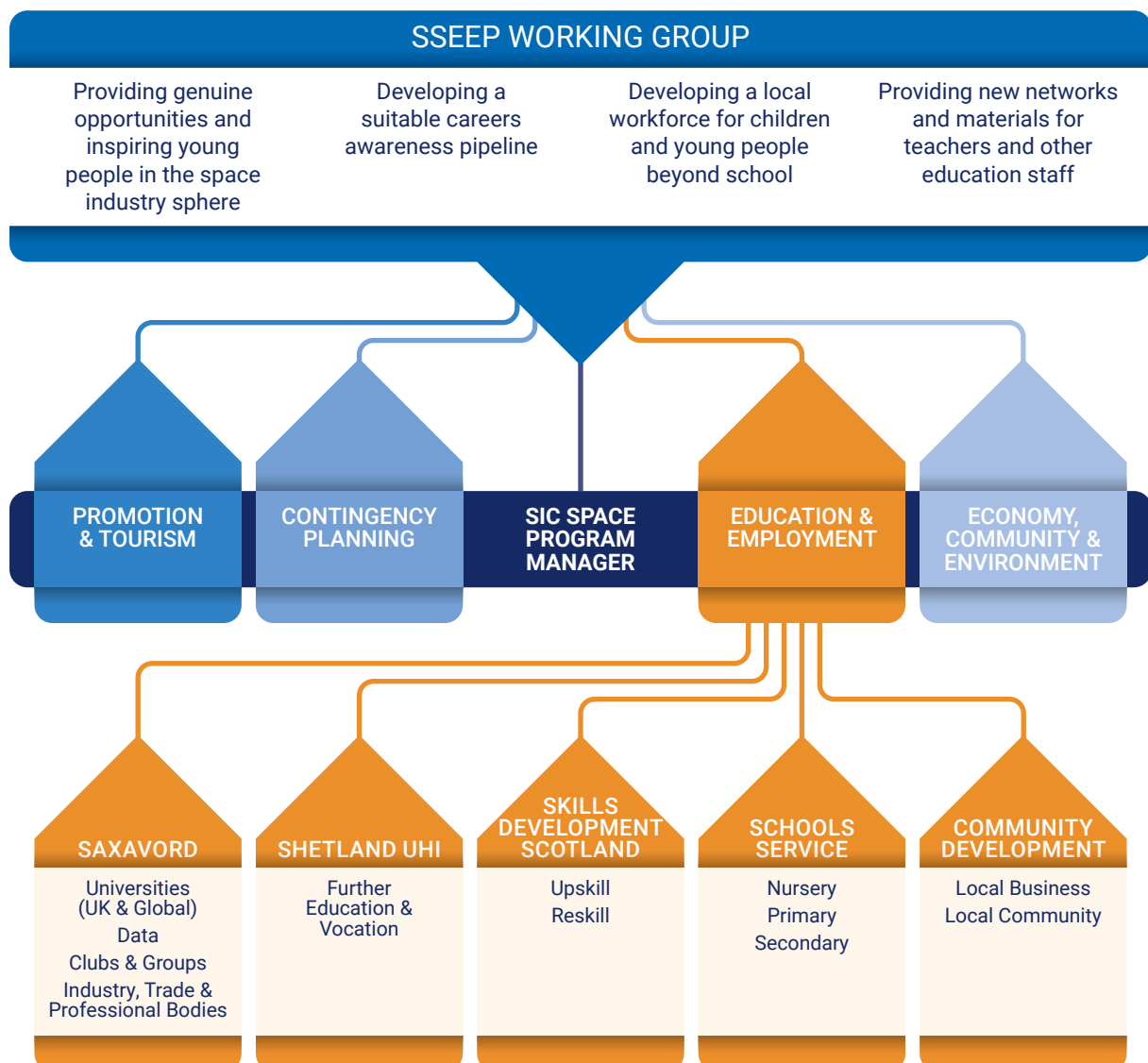
This Strategy will be delivered by SaxaVord Spaceport in conjunction with its partners. SaxaVord's Education Strategy is built to complement the UKSA and Space Scotland educational strategies, and work done by Shetland Island Council and various national and international academic and industry partners<sup>5</sup>.

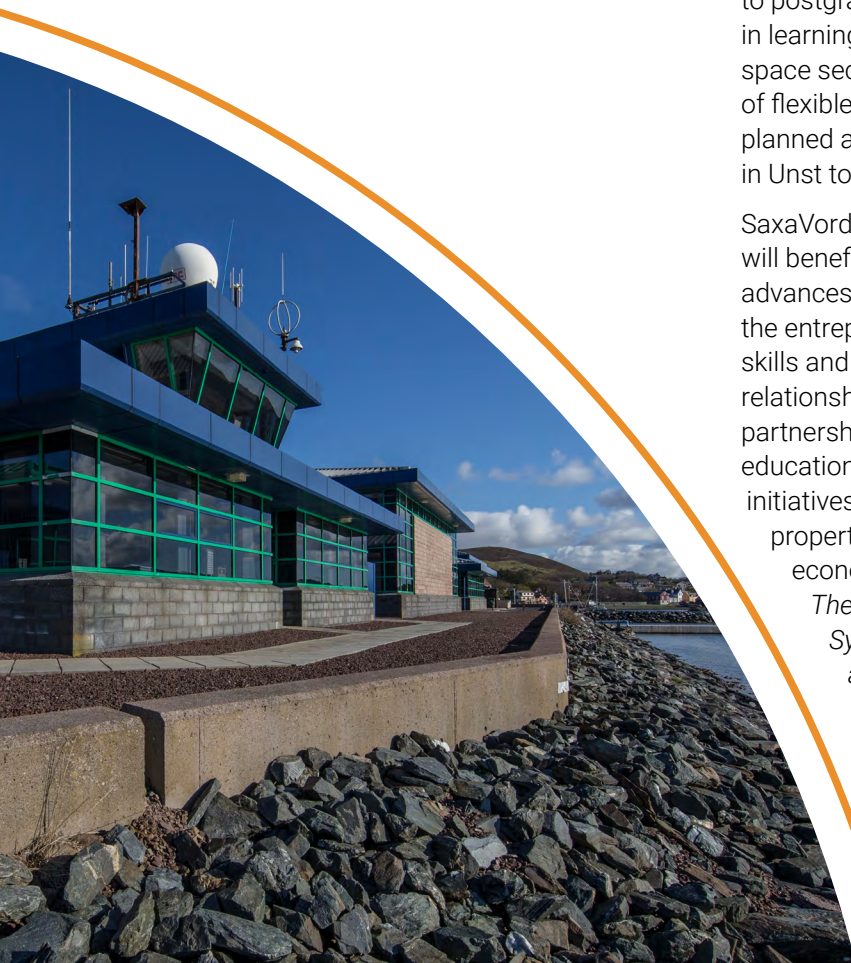
These include:

- **Academia**
  - .. National education bodies, universities, schools
    - ... Scotland, UK, EU, North America
- **Representative groups**
  - .. Trade bodies, student groups, professional institutions and teacher networks
- **Community**
  - .. Community councils, youth workforce
- **The space sector**
  - .. Companies and university research groups to help improve outreach, access to career development and support for educational initiatives.
- **Government and agencies**
  - .. Education Scotland, DfE, BEIS, STFC, ESA, UKSA, NASA STEM, JPL-NASA
    - ... Shetland Islands Council, DYW Shetland, Skills Development Scotland
- **Space education and outreach organisations**
  - .. ESERO-UK, National Space Centre
  - .. Global Spaceport Alliance
- **Industry**
  - .. Spaceports, rocket companies, data solutions, satellite companies
    - ... Shetland: Mesomorphic, Ocean Kinetics, Pure Energy
- **Parents**
  - .. Engagement with parents remains the biggest influencer of subject choices and career pathways<sup>6</sup>.

## SHETLAND SPACE EDUCATION & EMPLOYMENT PIPELINE WORKING GROUP

We are fortunate that Shetland Islands Council has welcomed the opportunity to partner with SaxaVord Spaceport in many ways. The partnership extends beyond education, with other working groups focusing on economic development and environment, tourism and contingency planning. All groups report to an SIC Project Board chaired by the SIC Chief Executive.





A unique government-industry partnership, SSEESP comprises industry leaders and stakeholders from around the world interested in developing and promoting the Shetland Islands. The Education and Employment sub-committee comprises school and university leaders and SaxaVord Spaceport education staff. The working group's overarching vision and purpose are to create opportunities for young people in Shetland to make a career in the space industry and related sectors and to support well-paid, permanent employment in the islands.

UHI Shetland is Shetland's Tertiary Education provider, offering Further and Higher Education opportunities alongside skills and vocational training. UHI Shetland is working closely with SSEEP partners to ensure the pipeline extends opportunities beyond school, through to postgraduate and professional learning. Investment in learning facilities linked to Shetland's developing space sector is a key priority, with the development of flexible learning spaces for STEAM subjects planned alongside a redeveloped Learning Centre in Unst to support our shared ambitions.

SaxaVord Spaceport and the space industry will benefit from partnerships with governments, advances in science and technology from academia, the entrepreneurialism of businesses, more vital skills and education and more robust and diverse relationships with partners worldwide. Working in partnership, SaxaVord Spaceport can spearhead education, innovation, technology and sustainability initiatives, generating jobs, income and intellectual property in the UK while contributing to sustained economic growth and benefits for the community.

*The space ecosystem is highly interconnected.*

*Systems and structures across our economy and the world affect how we can achieve the strategy's goals, from the regulatory environment and skills to international cooperation, science and technical capability<sup>7</sup>.*





## STRATEGIC AIMS

This strategy aims to ensure that as many young people as possible are inspired by space so that they will study and engage with STEAM subjects to a tertiary level, ensuring a skilled and enthusiastic workforce for space.

This will only be achieved through strong collaborations between SaxaVord Spaceport and its partners in education, sustainability, government, industry and academia. A robust education strategy mirrors the growing workforce demand in the maturing UK space sector. Therefore SaxaVord Spaceport, Shetland, Scotland and the UK must position themselves as the career destination of choice for the brightest and best STEAM students at all levels. One of the most significant challenges is the UK space industry encouraging home-grown talent to remain within the UK. As an emerging leader, SaxaVord Spaceport is well-positioned to build the future Highlands and Islands workforce. These aims will be accomplished through:



**1** Forging collaboration opportunities with the UK Space Agency, the UK Government Departments of International Trade and Business, Energy and Industrial Strategy and the European Space Agency, and to engage with international opportunities to work with other space nations or regions.



**2** Developing a world-class space research environment and enterprise infrastructure to enable economic growth through increased exports, innovation opportunities, access to investment for company growth and inward investment in SaxaVord Spaceport and Shetland.



**3** Building on Scotland's position as a leading UK location and its environment for cutting-edge, market-led space technology development.



**4** Increasing sustainability opportunities and corporate knowledge creation.

SaxaVord Education and Innovation Officer, Mason Robbins. →



# STRATEGIC CONTEXT

The SaxaVord Spaceport has four inter-related responsibilities directly tied to the SSEESP terms of reference.

These are to:

- **Entrench SaxaVord Spaceport at the centre of Shetland, Scotland and UK space educational strategy – *Scottish NASA Initiative*.**
  - .. Research, activities and initiatives are driven by engaging education and sustainability in space.
  - .. Research and development inputs.
  - .. Collaborative relationships with government, academic and industry partners.
  - .. Centre of Excellence for Space.
  - .. R&D facility.
- **Deliver a range of regional and national space programmes in cooperation with industry and academia.**
  - .. **Academic Support**
    - ... Space clubs / Ambassador programmes on university campuses
    - ... Link into scholarships and educational support opportunities
    - ... Engagement of “sport and space” and UN Development Goals
    - ... Curriculum / lesson plans and resources
    - ... Promoting STEAM at the core of operations
  - .. **Events**
    - ... On-campus / hybrid / virtual
    - ... Space Camp
    - ... Events around the suborbital and orbital launches
    - ... International Scotland Space Day
    - ... Speaker series, debates, VIP visits
    - ... Competitions and hackathons
    - ... Sustainability and community partnerships
  - .. **Internships, apprenticeships, experience opportunities**
    - ... Ensuring youth are involved in the foundations of the future of space in Shetland.
    - ... Youth-Spaceport collaborations
    - ... School and university Trips
    - ... Young Person Guarantee



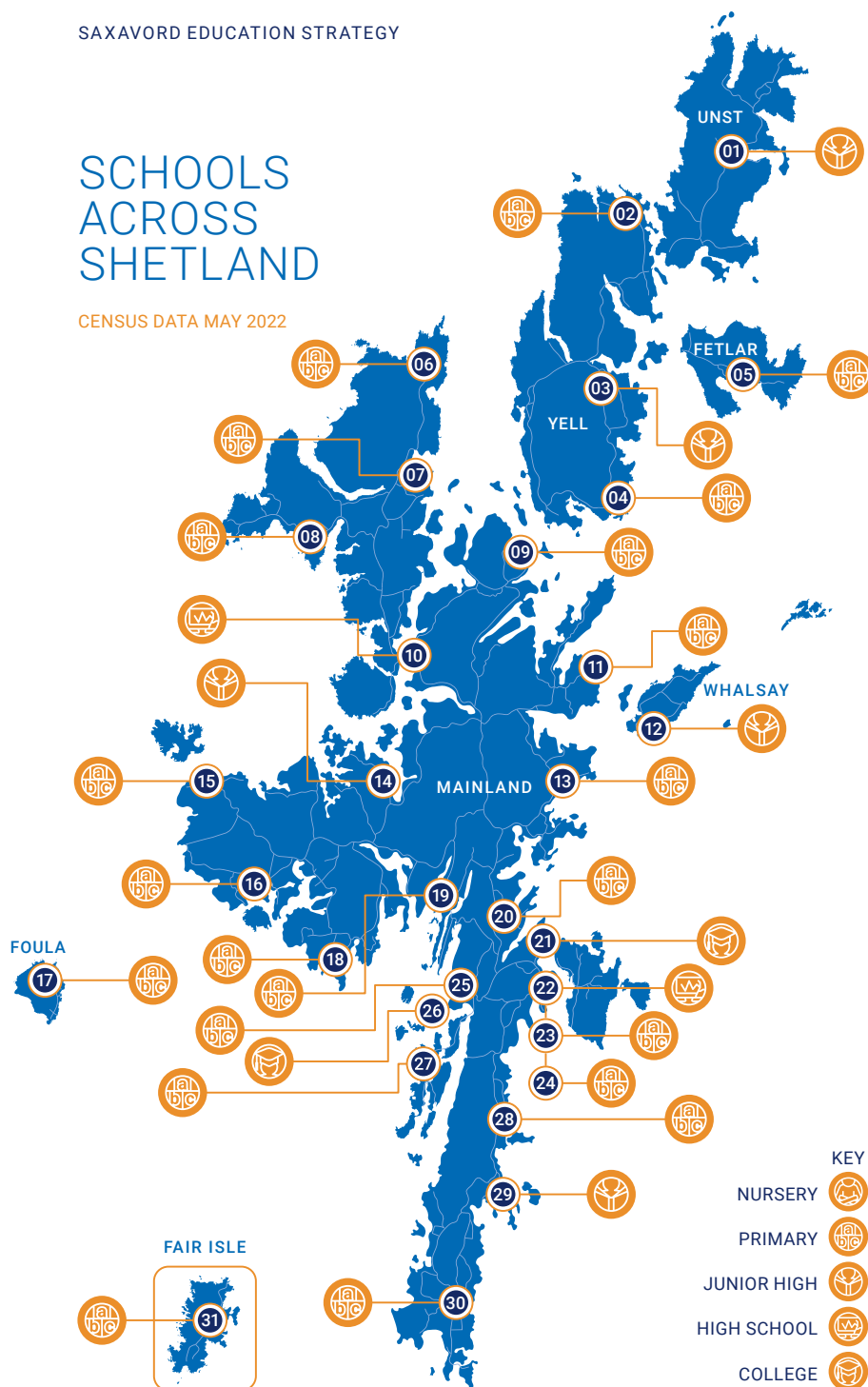
- **Build a more robust regional and national space capability encompassing scientific and industrial centres of excellence and a growing, skilled Shetland Islands space workforce.**
  - .. **Integration of horizontal space education lifecycle into school strategic curriculum**
    - ... Network of global schools, colleges and universities
    - ... Every child and young person based in Shetland given the opportunity to connect with SaxaVord Spaceport
    - ... Children to fully understand the opportunities that are available for working in the space industry
    - ... Young Person Guarantee
    - ... Ambassadorships, internships, apprenticeships, work placement opportunities
    - ... Opportunities for kids to visit and interact with space
    - ... *Establishment of neurodiverse charity*
  - .. **Visitor centre at Saxa focused on interaction and connectivity with the spaceport and partners within the greater SaxaVord Spaceport ecosystem.**
    - ... Innovation and R&D Centre
- **Complement Scottish Government, UK Government and NATO space domain policy for Education, Innovation, Technology and Sustainability (EITS) while building corporate knowledge creation and training.**
  - .. **Using this strategy, creating a position and expertise in EITS to influence and impact government and military space domain policy.**

◀ Winning painting in SaxaVord art contest, by children Signe and Lockie Bullough.



# SCHOOLS ACROSS SHETLAND

CENSUS DATA MAY 2022



## PRIMARY SCHOOLS

02 Cullivoe Primary School	0	10	10 PUPILS
04 Burravoe Primary School	0	10	10 PUPILS
05 Fetlar Primary School	0	1	1 PUPILS
06 North Roe Primary School	0	16	16 PUPILS
07 Ollaberry Primary School	0	22	22 PUPILS
08 Urafirth Primary School	14	23	37 PUPILS
09 Mossbank Primary School	13	41	54 PUPILS
11 Lunnasting Primary School	14	24	38 PUPILS
13 Nesting Primary School	0	21	21 PUPILS
15 Sandness Primary School	0	17	17 PUPILS
16 Happyhansel Primary School	12	37	49 PUPILS
17 Foula Primary School	1	4	5 PUPILS
18 Skeld Primary School	3	13	16 PUPILS
19 Whiteness Primary School	18	68	86 PUPILS
20 Tingwall Primary School	32	82	114 PUPILS
23 Bells Brae Primary School	45	294	339 PUPILS
24 Sound Primary School	41	243	284 PUPILS
25 Scalloway Primary School	40	143	183 PUPILS
27 Hamnavoe Primary School	0	87	87 PUPILS
28 Cunningsburgh Primary School	27	69	96 PUPILS
30 Dunrossness Primary School	18	94	112 PUPILS
31 Fair Isle Primary School	1	3	4 PUPILS

## HIGH SCHOOLS

10 Brae High School	36	150	145	331 PUPILS
22 Anderson High School	0	0	954	954 PUPILS

## COLLEGES

21 Shetland College (UHI)	
26 NAFC Marine Centre (UHI)	

## JUNIOR HIGH SCHOOLS

01 Baltasound Junior High School	16	43	28	87 PUPILS
03 Mid Yell Junior High School	12	33	52	97 PUPILS
12 Whalsay School, (Junior High)	23	101	46	170 PUPILS
14 Aith Junior High School	29	114	105	248 PUPILS
29 Sandwick Junior High School	20	97	121	238 PUPILS

# BACKGROUND

## Education

The Strategy is informed by UKSA and the UK Government's industry-led Space Innovation and Growth Strategy. The SAXA Space Education Action Plan will set out the Space Growth Action Plan, sets out various recommendations concerning education and skills in the space sector. In particular, the Government accepted Action 5.7: "to establish a national space skills 'point of contact' to support SMEs in finding training in business and specialist skills that their staff need to succeed and grow the business by supplying 'one stop' information; about UK-based training providers."

This strategy fits within the more significant space industry's call for an increase in knowledge transfer, awareness and education, namely:

- **Scotland:** Curriculum for Excellence (2010)
  - .. **For children and young people aged 3-18. It's an approach designed to provide young people with the knowledge, skills and attributes they need for learning, life and work in the 21st century. CfE is centred on the four capacities aimed at helping children and young people to become: Successful learners, Confident individuals, Responsible citizens and Effective contributors.**
- **Scotland:** Space Strategy (Oct 21)<sup>8</sup>
  - .. **Challenges ahead 3) Education and STEM: Building toward the goal of supporting industry growth through attracting an increased and diverse workforce and ensuring cutting-edge innovation.**
- **UK:** Defence Space Strategy (Feb 22)
  - .. **D:2) Continue to enhance the UK SpOC in partnership with UKSA to support the government's ambition of creating a "sophisticated" combined military, civilian, and National Space Operations Centre.**
- **Space Industries Act (2018)**
  - .. **The UK law and general rules regulating spaceflight and associated activities.**
- **NATO:** Overarching Space Policy (Jan 22)
  - .. **14) Training and Exercises - ... a view to advancing Alliance-wide understanding of the space domain, considering the extensive network of NATO's educational and training facilities, international education and training institutions, entities and programmes.**



It is important to position this strategy within the context of the educational strategies and objectives of government, international partners and academia to provide access to space for all. Grounded in sustainable practices, this strategy is designed to drive key priorities for SaxaVord Spaceport as we progress towards being the first vertical launch facility and premier international green ground station network.

## Sustainability

SaxaVord Spaceport has put sustainability and safety at the top of its priority list from the get-go. Our thorough and extremely comprehensive Environmental Impact Assessment Report (EIAR), submitted as part of our planning application, was carefully developed to include multiple environmental management plans which range from short- to long-term.

For end-to-end sustainability once construction of the launch site is complete we will continue to assess environmental impacts and will have complete photographic documentation of landscape changes.

We will have a well-developed launch campaign and after-action report process with a focus on how to reduce impacts or change operations to improve sustainability.

As well as a vertical launch site at Lamba Ness, SaxaVord Spaceport has a network of ground stations designed to download data from satellites, which pass overhead more often and for longer than at lower latitudes. We have and will continue to invest in renewable power for our ground stations and explore the potential for all spaceport and related buildings to harness wind, solar and tidal energy.

Looking to the future, environmental sustainability will likely be measured against our ability to have low carbon operations. We aim to achieve social sustainability by continuing to integrate with the local community and open up exciting opportunities for all. We are confident that our involvement in the space industry will help with the global achievement of the United Nations Sustainable Development Goals.

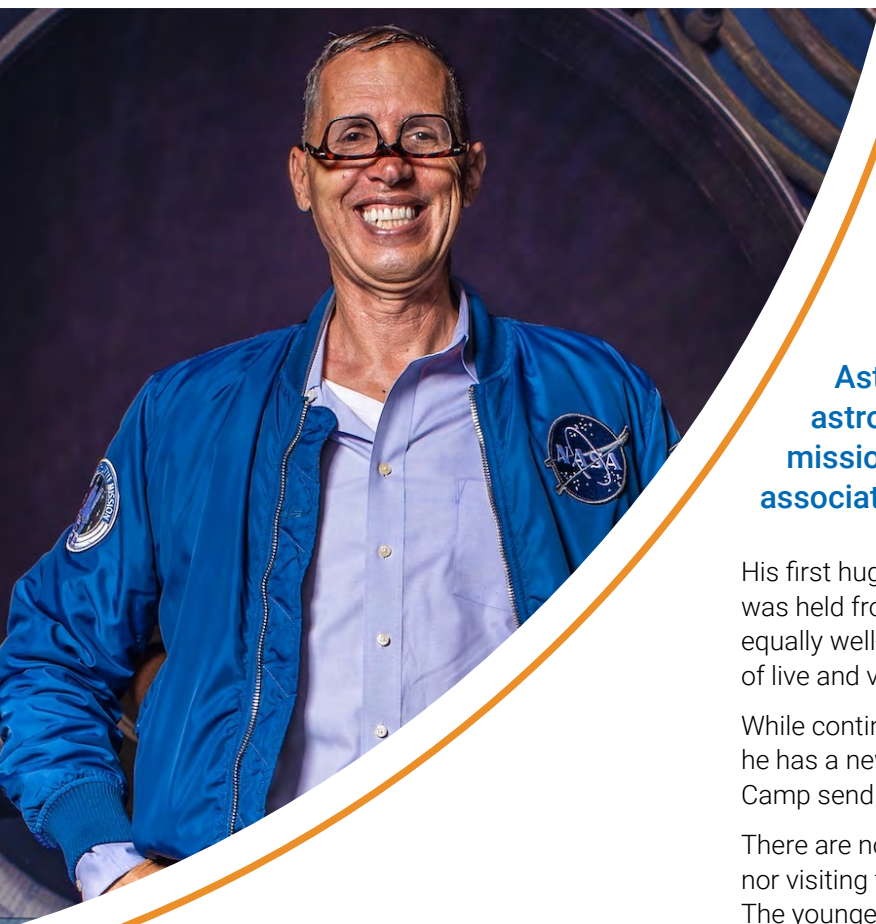
Satellite data can be used downstream to aid the fight against climate change as well as being an almost essential part of daily life. It has been estimated that individuals interact around 20 times with a satellite each day before noon. (Navigation, weather, TV, radios, tracking flights.)

For the human race to be sustainable stewards of the earth, we need to know how our actions are affecting the world around us. Satellite data provides us with the means necessary to make informed decisions and view how anthropogenic impacts really are affecting the globe. SaxaVord is helping play a key role in collecting earth observations from space, allowing us here on the ground to see not only how beautiful our planet is but also how fragile.

✦ SaxaVord Spaceport Sustainability Officer,  
Sorcha Leavey.







## MIKE MONGO

**Astronaut teacher - and prospective astronaut himself on the Blue Horizon mission - Mike Mongo has a long association with SaxaVord Spaceport.**

His first hugely successful virtual Astronaut Job Camp was held from Unst in the summer of 2021, with an equally well-attended and inspiring Camp - a mixture of live and virtual sessions - in 2022.

While continuing to support SAXA STEAM activities, he has a new mission - to build on the legacy of the Camp send a kid to space (K2S).

There are no minimum ages for travel to space, nor visiting the International Space Station (ISS). The youngest astronaut to date was 18, and the youngest to visit the ISS was 28.

Mike says: "It can be any young student – if they do the work to get there. This will move the needle of what is possible for every student in the world. And if there's anything you can do to help move this forward, I appreciate you."

SaxaVord Spaceport has set both itself and its partners a challenge to get two children under the age of 16 to follow Mike's example and prove that kids can get to space too. The Shetland Kids(Too) Space programme is being designed to foster excitement and interest in all things space throughout all school age groups and while others are talking about it as something for the future we will endeavour to make it happen within the next three years and create real life role models for the "New Space" generation.

SaxaVord Spaceport has set up a children's charity, "Gifted Stars", to enable neurodivergent children to find a way to harness their special powers to work in the space industry as well as participate in science and the arts via STEAM activity. One in three employees at NASA are neurodivergent and SaxaVord wants to show both children and parents that there is an exciting future for them in the sector and that being different is not necessarily a bad thing.

# WHAT DOES 2030 LOOK LIKE?

**SaxaVord Spaceport works to deliver an industry-leading space educational strategy. The strategy's primary goal is to foster the growth of the space and supporting sectors in Shetland, the Highlands and Islands, Scotland, the UK and beyond to maximise the benefit of space education, sustainability, commerce and society.**

The central goal in becoming industry-leading in the UK by 2030 is to be achieved via:

- **Growth through education**
- **Growth through sustainability**
- **Growth through innovation and research**
- **Growth through collaborative partnerships**
- **Growth through world-class programmes**

This will be accomplished through:

- **Becoming a leader in Education, Innovation and Sustainability**
- **Embedding education in everything we do (including a contract clause for companies to have an educational/sustainability give back to Shetland)**
- **Benchmarking in Europe as the "Scottish NASA Initiative".**
- **Cross-pollinating collaborations such as Hub at UHI – Shetland / UHI hub at SaxaVord Spaceport.**

# ANALYSIS: THE SKILLS PIPELINE

According to the UKSA, the decision of an individual to take up any STEAM-related career (or indeed to work in the space sector) is influenced by many experiences from early childhood onwards. And space-related learning activities may be used to improve education outcomes for all ages. Hence it is essential to consider what interventions are appropriate for each age group and to identify the role of the UK Space Agency (and SaxaVord Spaceport) and its partners at each stage. It is essential to ensure that we actively encourage the whole male and female population throughout the pipeline. Currently, women are under-represented in the older age groups. There is evidence of successful interventions that will engage this sector of the population.

The Strategy has identified the following five curriculum levels with progression to the senior phase (S4-S6) in Scotland plus higher and continuing education as the targeted areas for working with youth towards preparing students for working in STEAM under the Scottish Young Person's Guarantee Proforma.

- **Early level: Age 3 to P1**  
 ➡➡➡ **BLAST-OFF:** The beginning of the space journey
- **First level: P2, P3, P4**  
 ➡➡➡ **DISCOVER:** Like the pioneers before, they discovered the wonders of space
- **Second level: P5, P6, P7**  
 ➡➡➡ **INSPIRE:** The engagement of the imagination and creativity around space
- **Third/Fourth level: S1, S2, S3**  
 ➡➡➡ **ASPIRE:** Direct one's hopes or ambitions towards achieving something
- **Senior phase: S4, S5, S6**  
 ➡➡➡ **CHALLENGE:** Take on the challenges and discover new ways of understanding
- **College / Vocational Training:**  
 ➡➡➡ **ENTERPRISE:** A project or undertaking, especially a bold or complex one
- **Higher Education:**  
 ➡➡➡ **ENDEAVOUR:** Try hard to do or achieve something beyond what is known
- **Continuing Education:**  
 ➡➡➡ **OPPORTUNITY:** Circumstances that make it possible to do something
- **Career:**  
 ➡➡➡ **INNOVATE:** Make changes to something established, especially by introducing new methods, ideas, or products.



← Summer interns 2022 with Sorcha Leavey, Sustainability Officer.



## SAXAVORD SPACEPORT HORIZONTAL LIFE CYCLE OF SPACE EDUCATION VISUALISATION

PHASES	LAUNCH		SUBORBITAL EXPLORATION	
Education Levels	Early Level	First Level	Second Level	Third/Fourth Level
Age Groups	Nursery to P1 (Age 3 – 6)	P2 – P4 (Age 5 – 9)	P5 – P7 (Age 8 – 12)	S1 – S3 (Age 11 – 15)
Key Focus	BLAST-OFF	DISCOVER	INSPIRE	ASPIRE
Academic Support	<b>Board General Education</b> <ul style="list-style-type: none"> <li>Curriculum support and development with partners</li> <li>Promote STEAM, including Arts</li> <li>Nasa STEM @ Home K-4</li> </ul>	<b>Board General Education</b> <ul style="list-style-type: none"> <li>Curriculum support and development with partners</li> <li>Promote STEAM, including Arts</li> <li>Sport and space</li> <li>Nasa STEM @ Home K-4</li> </ul>	<b>Board General Education</b> <ul style="list-style-type: none"> <li>Curriculum support and development with partners</li> <li>Sport and space</li> <li>Nasa STEM @ Home 5-8</li> </ul>	<b>Board General Education</b> <ul style="list-style-type: none"> <li>Curriculum support and development with partners</li> <li>Sport and space</li> <li>UN Dev Goals</li> <li>Nasa STEM @ Home 5-8</li> </ul> <i>(see official science Experiences and Outcomes, as well as mathematics, IT)</i>
Events	General interest and space fun		Summer camps, Career Guidance	
Speaker Series, Debates, VIP Visits	Visits from space leaders (hybrid and in-person)		Visits from space leaders (hybrid and in-person)	
Competitions Hackathons	Art projects, Lego Mind storm Workshops, Space helmets, Meteor impacts activity, Foot-stomp paper tube rockets, Mascot Development		Lego Mind storm Workshops	
Experiences	Engagement with parents to help develop space projects at home		Class trips, Youth-Spaceport collaborations, museum series	

ORBITAL EXPERIENCE	INTERPLANETARY RESEARCH		COSMOS COLLABORATION	INTERSTELLAR PIONEERING
Senior Phase	Vocational Training	Higher Education	Adult /Community Education	Space Career
S4 – S6 (Age 14 – 18)	College	University	Continuing Education	
CHALLENGE	ENTERPRISE	ENDEAVOUR	OPPORTUNITY	INNOVATE
<ul style="list-style-type: none"> <li>Curriculum support and development</li> <li>Space Clubs</li> <li>Ambassadors</li> <li>Scholarships</li> <li>Mentors for SQA qualifications Preparation               <ul style="list-style-type: none"> <li>Apprenticeships</li> <li>Uni/apprenticeship /workplace</li> </ul> </li> <li>www.sqa.org.uk               <ul style="list-style-type: none"> <li>course specs for physics, Eng. Sci, computer science.</li> </ul> </li> <li>Institute of Physics</li> <li>UKSEDS</li> <li>UN Dev Goals</li> <li>Nasa STEM@Home 9-s12</li> </ul>	<ul style="list-style-type: none"> <li>Work experience, academic support, college collaborations</li> <li>Career Guidance</li> <li>UKSLP Programme Overview</li> <li>Space 101 Webinar</li> <li>Curriculum development</li> <li>UKSEDS</li> <li>Develop EU Space Recovery course</li> <li>Maritime Security</li> </ul> <p><b>Trade:</b></p> <ul style="list-style-type: none"> <li>LM Trade associations.</li> <li>Webinars with trade bodies, SSC, LM, Shetland Suppliers, educational institutes</li> <li>Supply chain training</li> </ul>	<ul style="list-style-type: none"> <li>Curriculum support and development with partners</li> <li>Ambassador program, support of existing Space clubs</li> <li>Scholarships</li> <li>Competition support</li> <li>Career Guidance</li> <li>UKSLP Programme Overview</li> <li>NASA STEM Higher Education</li> </ul>	<ul style="list-style-type: none"> <li>Reskill Workforce</li> <li>Inspire</li> </ul>	<p>R&amp;D Centre</p> <p>Job Opportunities:</p> <ul style="list-style-type: none"> <li>Spaceport Ops Manager</li> <li>Systems Engineer</li> <li>Aerospace Engineer</li> <li>Environmental Engineer</li> <li>Communications Eng.</li> <li>Data Scientist</li> <li>Data Analyst</li> <li>Cyber Operator</li> <li>Software Developer</li> <li>Astro med</li> <li>IT / Security</li> <li>Range Officer</li> <li>Safety Officer</li> <li>Environmental officer</li> <li>Training officer</li> <li>Tour Operator</li> <li>Electrician</li> <li>Social Sci-Art, sociology</li> <li>Hospitality</li> </ul>
Mock Interviews, CV Assistance, Career events, host debates	Career events, host debates, Space 101 Webinar		Career events, host debates, Space 101 Webinar, Mock Interviews, CV Assistance	
Visits from space leaders(hybrid and in-person), Model space agency, debates and debate club activities	Visits from space leaders (hybrid and in-person), Debates on advanced issues with industry experts			
Model rockets, coding challenges	Thor rocket data, launches, satellite building			
Class trips, Youth-Spaceport collaborations, museum series	Apprenticeships, Work placements Ambassadors, Internships, trips, exchange programs, Collaborative projects, Talent pipelines, museum series			

# DELIVERY MECHANISMS

Working in concert with the SEESP WG, UHI-Shetland, DYW, SIC, and our various international partners and building on the SEESP WG Terms of reference as a further co-created guidance for the education strategy of Shetland, the following delivery mechanisms will be implemented.

- **Communicating ideas and opportunities:**  
Communicating ideas about STEAM education, careers and opportunities to the kids of Shetland, Scotland, UK and beyond.
  - .. SaxaVord Spaceport provides a direct and tangible connection between space and the community with opportunities for future generations at the core of operations. Success will be measured by the engagement with the material over the coming academic year.
- **Inspiring:** Inspiring the next generation of explorers, scientists and entrepreneurs.
  - .. Inspiring an energised and excited young person workforce ready to take advantage of opportunities at SaxaVord Spaceport as apprentices, summer placements, future university ambassadors for Scottish Space, and/or SaxaVord Spaceport scholars.
  - .. The Strategy provides the initial, more general engagement with students, laying the foundation for measuring the longer-term impact of space education, sustainability and innovation.
- **Benchmark for success:** Putting Shetland, Scotland and the UK on the map as a space knowledge and innovation resource.
  - .. The development of a peer-reviewed space camp curriculum that has been piloted and edited and that could be exported to other institutions across the UK.
  - .. A series of videos, lesson plans and connections from around the world which see the opportunity and value of the UK space market, which becomes an ecosystem of knowledge that UKSA and partners can use.
  - .. Success is measured by the increasing global interest of experts wanting to be involved in a partnership with SaxaVord Spaceport and increases in students worldwide asking us for job opportunities.
  - .. Continue to review and monitor the skills needed across the company and Shetland and help develop strategies to address these needs by nurturing skills development and attracting skilled staff into the sector.



- **Global connection:** Inspire Shetland, Scotland and beyond by connecting our kids with like-minded kids worldwide.
  - .. A global network of affiliated universities, ambassadors, schools and students.
  - .. Success is growing a global network of affiliated schools and students who engage with the summer camps and STEAM events.
- **Provide foundational input:** Provide the foundation for the Scottish Space Education Strategy
  - .. A library of resources, documents, interviews and interactions will feed into the broader education strategy and conversation within the UK and Scottish space sector.
  - .. This library will feed into the broader education strategy and conversation within the UK and Scottish space sector. Success will be UKSA and education partners engaging with the content that has been created.
  - .. Complement Scottish Government, UK Government and NATO space domain policy for Education, Innovation, Technology and Sustainability (EITS).
- **Opportunity:** Opportunity for Highlands, Islands and rural kids and families for high-tech space-based jobs which are real and tangible, and how to get there.
  - .. Work locally, regionally and nationally with those responsible for developing educational information, advice and guidance for all ages to ensure that support and materials on the space industry are easily accessible, including role models, work experience, internships/apprenticeships and information on job opportunities.
  - .. Engaging pupils in STEAM by using space and maintaining and developing the interest of the most enthusiastic students by providing suitable opportunities.
  - .. Current and former astronauts have expressed interest in partnering with schools in Shetland and Scotland as a value-added experience for future generations of astronauts.

- .. The SaxaVord Spaceport space camps will demonstrate that the first edition was not a one-off but a commitment to the communities that space is the future.
- .. Success is measured by the engagement of the rural communities with the space sector. Again, this is not solely for Shetland but across Scotland.
- **Build on the future of STEAM education:** Build on the future of STEAM education in Scotland and the UK.
  - .. The ultimate goal is to provide rural, Highlands and Islands communities with tangible opportunities in STEAM pathways. The educational strategy is designed to inspire students' imagination while laying the groundwork for future opportunities within space.
  - .. Encourage and support the use of space as an inspiring context for learning across all age groups. The emphasis will be on supporting non-specialist teachers in the use of space in teaching, principally by improving the quality and availability of space-related teaching materials. SaxaVord Spaceport will create an ecosystem of information.
  - .. Develop and implement broader outreach programmes to improve awareness and engagement with the UK's space programme.
  - .. The Strategy is designed to provide a blueprint for students' engagement with the UK's bigger cities and towns.

Success in all of the above will be measured by commitments from local councils and schools to engage with the resources in their educational curriculum.

*"I was a five-year-old girl in Primary 1 when work began to build the Sullom Voe Oil Terminal. Throughout my school years, we were never encouraged into the oil and gas industry. Even when it came to leaving school and thinking of careers, Sullom Voe never featured, especially for females, unless it was as a cleaner or a kitchen worker. While those jobs are needed, we were not encouraged to aspire to be more or to think of ourselves as part of the industry. That's why I am so happy to see the education work being done now with all our Shetland bairns, allowing them to picture themselves as part of this emerging industry for Shetland and Scotland, and playing their part in the future of space."*

**Carol Duncan, Project Administrator, SaxaVord Spaceport**

# EVALUATE

## How SaxaVord Spaceport will achieve our goals


Achieving SaxaVord Spaceport's strategic goals within the global space industry will require coordinated effort and actions across the entire SaxaVord Spaceport ecosystem of partners and clients. The UK National Space Strategy 2021 states *the UK will require a significant increase in private sector investment in space activities, alongside the full combined efforts of every participant in the UK space economy, from businesses to innovators, entrepreneurs, and space scientists*<sup>9</sup>. Thus, as the global space sector grows, develops and matures, private companies must continue to grow and evaluate their performance, not independently but in concert with partners and peers across the sector. We understand that our strategy's creation is unique because it engages a broad range of partners in its design.

We will evaluate the education strategy by:

- **Producing an annual summary report to the SSEESP Working Group outlining delivery against strategic aims.**
- **Assessing the number of undergraduate work experience places and expand the times of the year they are offered.**
  - .. **YTD:** Two in summer 2022
  - .. **Aim:** Increase work placement opportunities to one per year with year-round opportunities in 2023
- **The number of overseas interns**
  - .. **YTD:** One in 2022
  - .. **Aim:** Annually advertise one or two opportunities
- **Space Camp attendance and engagement**
  - .. **YTD:** 874 pupils from 81 schools
  - .. **Aim:** annual 15% growth of Astronaut Job Camp participation and engagement coincided with the start of the K2S programme
- **DYW/SDS engagement with Shetland schools and programmes**
  - .. **YTD:** SaxaVord Spaceport participated in four DYW/SDS programmes with eight school activations and three school partnerships (Baltasound Junior High School, Sandwick Junior High School, Anderson High School).
  - .. **Aim:** increase school partnerships by 10% annually with the minimum number of two new Shetland schools per year. Increase the number of events and STEAM activations by 15% annually, not including client/company partners' school visits.
- **University ambassador programme**
  - .. **YTD:** Two ambassadors (Edinburgh University and Strathclyde University)
  - .. **Aim:** Increase the programme annually by one ambassador and expand into other non-STEM-related areas to further highlight the importance of the arts.
- **University-wide partnerships**<sup>10</sup>



- .. **YTD:** Three in advanced stages of completion (UHI-Shetland, Strathclyde University, University of Alaska – Fairbanks)
- .. **AIM:** Complete the three partnerships and annually add one university partnership.
- **STEM Ambassador programme**
  - .. **YTD:** One registered STEM Ambassador
  - .. **AIM:** Annually increase the number of SaxaVord Spaceport staff as STEM ambassadors by one<sup>11</sup>.
- **SaxaVord Spaceport clients actively participate in the education strategy, such as school visit/education material**
  - .. **YTD:** One client - main spaceport construction contractor DITT - has engaged with local schools.
  - .. **AIM:** 50% participation by clients in engaging with local schools, a requirement included in SaxaVord Spaceport client contracts.



*"HyImpulse is developing small orbital launchers and sounding rockets based on our innovative hybrid rocket propulsion technology. We have been working together with SaxaVord for more than two years on this exciting frontier of New Space. We have been impressed so far with the effort that SaxaVord is putting into education, not only for school age pupils, but also with undergraduate and graduate interns, who have visited us as part of their work experience at the UK's first launch site. Education about space is vital for SaxaVord and also HyImpulse, and we all have part to play and we look forward to collaborating with SaxaVord in the future."*

**Mario Kobald, CEO, HyImpulse**

# WHAT DOES 2050 LOOK LIKE?

**By the year 2050, humans may have established a permanent presence on the Moon and a research base on Mars, while space travel will become a regular occurrence for many people.**

As the only Spaceport in the UK rated for orbital launches, SaxaVord Spaceport will be at the centre of LEO, lunar and interplanetary space travel for Europe. This was alluded to through the Scottish NASA Initiative mentioned earlier in the strategy. As a champion of space for all, SaxaVord will be the premier facility for providing young persons opportunities to travel to, live, work and play in space.





# CONCLUSION

This document presents the background, rationale and goals of the SaxaVord Spaceport Education, Sustainability and Innovation Strategy. It guides specific actions to be taken by SaxaVord Spaceport and its delivery partners. It will be updated as appropriate to consider lessons learned and broader policy developments.





## FOOTNOTES

- 1 September 2021, [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/1034313/national-space-strategy.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1034313/national-space-strategy.pdf)
- 2 'New Space' refers to the increasing commercialisation of the space sector, moving beyond purely state activity
- 3 BEIS analysis using third-party market projections, detailed in the Technical Annex. This implies an annual growth rate of 5.6%.
- 4 <https://www.gov.scot/news/scottish-space-strategy-launched/>
- 5 Education Scotland (ES); Department for Education (DfE); Department for Business, Innovation and Skills (BIS); Science and Technology Facilities Council (STFC); the Environmental Task Force (ETF); the National Aeronautics and Space Administration (NASA); the European Space Agency (ESA); European Space Education Resource Office (ESERO-UK); Shetland Island Council (SIC). Advice on space education policy can be accessed through the UK Space Education and Skills Working Group, including DfE, BIS, STFC, NERC and ESERO-UK.
- 6 Emma Chittick, School Coordinator, Developing the Young Workforce - Shetland – 8 August 2022.
- 7 HM Government – National Space Strategy September 2021
- 8 Space Scotland's 2030 Goals: AT THE HIGHEST LEVEL, OUR AMBITION FOR 2030 IS FOR SPACE SCOTLAND TO DELIVER: An annual contribution to the Scottish economy in excess of £4bn. A 5 times increase in the workforce A globally recognised strategic location and European leader for commercial space developments. A range of managed launch and orbital services, supporting the highest launch cadence in Europe. An increased and diverse workforce with improved participation fully reflects Scottish society and ensures space is open for all.
- 9 HM Government – National Space Strategy September 2021
- 10 This does not include agreements or engagements with specialised areas of a University but the university as a whole.
- 11 <https://www.stem.org.uk/stem-ambassadors>



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