STEM Nation Award

Evidence template

For use by ELC settings, primary schools, secondary schools and ASN provisions within mainstream and special schools.

STEM Nation Award

Evidence

Applicant details

- Balmalloch Primary School
- North Lanarkshire Council
- SEED No. - 8358427
- John Paterson
- Date of submission

Setting profile

Balmalloch Primary School is a primary school located in Kilsyth, North Lanarkshire. Our school (and local area) is an isolated part of North Lanarkshire and is rural in nature. We currently have a school role of 369 in 14 classes. In Balmalloch, our vision is to be a “place of enthusiastic learning and achievement” where we place our values at the centre of everything we do and want to achieve. Our STEM provision has been updated and developed over the past 3 years as part of our school improvement.

Education Scotland
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STEM Nation Award

Leadership in STEM

- Balmalloch Primary have an established Young STEM Leader programme which engages a group of learners in the SSERC Programme. They plan, lead and self-evaluate STEM learning experiences across the school and nursery. Our YSLs plan, resource and support a STEM Week twice a year and support classes and staff in our weekly STEM afternoon.
- Our STEM Lead, John, has provided staff with CLPL and leadership opportunities to develop skills and knowledge in STEM. John also led a review of STEM planning and developed STEM planners and a STEM Overview for Early, First & Second Level.
- We are a recognised Digital School Award Scotland school and mentor school with a clear and coherent Digital Strategic Overview. Our Digital Lead, John, has supported the development of digital skills in the cluster, supported by the YSLs and Digital Leaders. Our Digital Lead supports staff, learners and families to access digital platforms, provide key learning opportunities and development of digital skills.
- A staff working party have contributed to school improvement in STEM over the past 3 years. A Digital & STEM Leader for each stage was established to support staff and learners with a member of staff at Early, First and Second Level.

Leadership in STEM

balmallochYSL
@BalmallochYSL

We have decided to run a school wide K'NEX and Lego competition. Classes need to build bridges for different functions. We judge the entries and choose a winning team. Check out these bridges from P5B! @balmalloch @YoungSTEMLeader

> **Balmalloch Primary** @balmalloch · Oct 19, 2021
> Today P5B took part in building bridges as part of a K'Nex/Lego competition. Each group produced awesome structures and it was down to Balmalloch Primary School's STEM Leaders to choose the winning group. Here are some pictures of all the entries.
> pic.twitter.com/XY0y8AFpgZpic.twitter.com/XY0y8AFpgZpic.twitter.com/XY...
> Show more

Young STEM Leader Christmas competition

The Young STEM Leaders have been working so hard to organise a Christmas themed stem week running from the 5th-9th December. Each class will either design a junk sleigh or build the tallest Lego Christmas tree. We kindly ask if you could begin to collect any cardboard and plastic or other recyclable materials and send them in to school for the classes to use.

Thank you in advance!
The YSL's

Balmalloch Primary
@balmalloch

Stem Afternoon: great fun with the P6 stem leaders building electrical circuits ⚡⚡⚡⚡⚡

Young STEM Leaders

Our Young STEM Leaders have created opportunities for all learners across the school. Our Young STEM Leaders support classes with their STEM learning opportunities.

Balmalloch Primary
@balmalloch

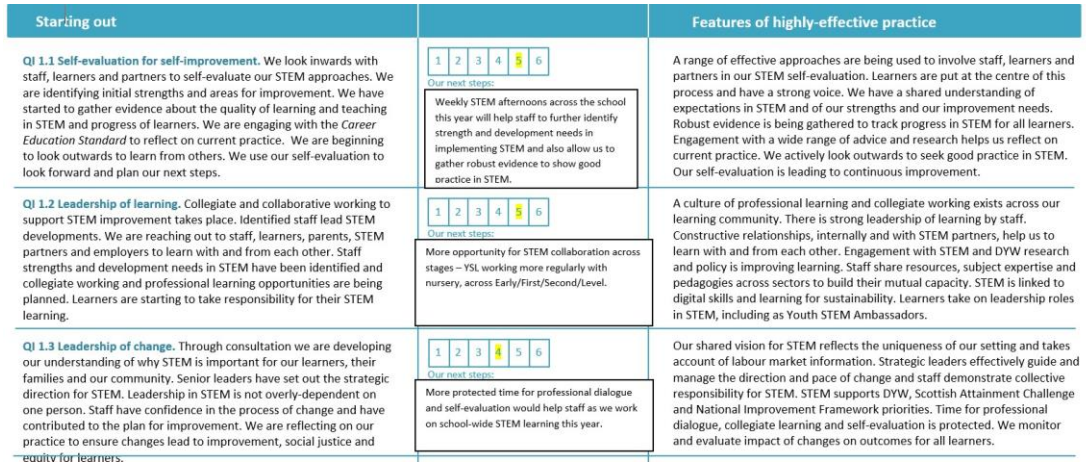
Yesterday our P3a pupils were lucky enough to have a lesson from our Young Stem Leaders! They learned about density through a frozen fireworks experiment, tried some ice fishing and learned about evaporation. Super work from our YSL Team!

Leadership in STEM

School Improvement Plan

STEM was fully integrated in our School Improvement Plans 2020 - 2023

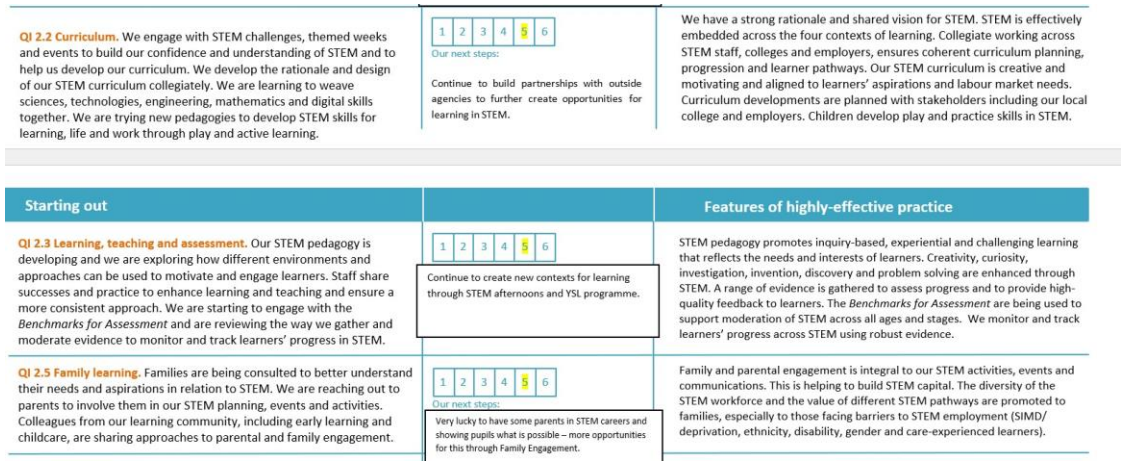
IMPROVEMENT PRIORITY 2:	**To improve opportunities for pupils to engage in STEM promoting development of employability skills and sustained, positive school leaver destinations for all learners.**
IMPROVEMENT PRIORITY 3:	To improve outcomes for learners through the provision of high quality learning experiences in STEM and DYW, supporting the development of skills, knowledge and understanding for life-long learning.
IMPROVEMENT PRIORITY 3:	To further develop a 'digital school' ethos and improve outcomes for learners through the provision of high quality learning STEM experiences supporting the development of skills, knowledge and understanding for life-long learning and work.



Starting out		Features of highly-effective practice
QI 1.1 Self-evaluation for self-improvement. We look inwards with staff, learners and partners to self-evaluate our STEM approaches. We are identifying initial strengths and areas for improvement. We have started to gather evidence about the quality of learning and teaching in STEM and progress of learners. We are engaging with the *Career Education Standard* to reflect on current practice. We are beginning to look outwards to learn from others. We use our self-evaluation to look forward and plan our next steps.	1 2 3 4 **5** 6 Our next steps: Weekly STEM afternoons across the school this year will help staff to further identify strength and development needs in implementing STEM and also allow us to gather robust evidence to show good practice in STEM.	A range of effective approaches are being used to involve staff, learners and partners in our STEM self-evaluation. Learners are put at the centre of this process and have a strong voice. We have a shared understanding of expectations in STEM and of our strengths and our improvement needs. Robust evidence is being gathered to track progress in STEM for all learners. Engagement with a wide range of advice and research helps us reflect on current practice. We actively look outwards to seek good practice in STEM. Our self-evaluation is leading to continuous improvement.
QI 1.2 Leadership of learning. Collegiate and collaborative working to support STEM improvement takes place. Identified staff lead STEM developments. We are reaching out to staff, learners, parents, STEM partners and employers to learn with and from each other. Staff strengths and development needs in STEM have been identified and collegiate working and professional learning opportunities are being planned. Learners are starting to take responsibility for their STEM learning.	1 2 3 4 **5** 6 Our next steps: More opportunity for STEM collaboration across stages – YSL working more regularly with nursery, across Early/First/Second/Level.	A culture of professional learning and collegiate working exists across our learning community. There is strong leadership of learning by staff. Constructive relationships, internally and with STEM partners, help us to learn with and from each other. Engagement with STEM and DYW research and policy is improving learning. Staff share resources, subject expertise and pedagogies across sectors to build their mutual capacity. STEM is linked to digital skills and learning for sustainability. Learners take on leadership roles in STEM, including as Youth STEM Ambassadors.
QI 1.3 Leadership of change. Through consultation we are developing our understanding of why STEM is important for our learners, their families and our community. Senior leaders have set out the strategic direction for STEM. Leadership in STEM is not overly-dependent on one person. Staff have confidence in the process of change and have contributed to the plan for improvement. We are reflecting on our practice to ensure changes lead to improvement, social justice and equity for learners.	1 2 3 **4** 5 6 Our next steps: More protected time for professional dialogue and self-evaluation would help staff as we work on school-wide STEM learning this year.	Our shared vision for STEM reflects the uniqueness of our setting and takes account of labour market information. Strategic leaders effectively guide and manage the direction and pace of change and staff demonstrate collective responsibility for STEM. STEM supports DYW, Scottish Attainment Challenge and National Improvement Framework priorities. Time for professional dialogue, collegiate learning and self-evaluation is protected. We monitor and evaluate impact of changes on outcomes for all learners.

Self-Evaluation

Our STEM Lead and YSL Tutor completed a STEM Self-Evaluation



QI 2.2 Curriculum. We engage with STEM challenges, themed weeks and events to build our confidence and understanding of STEM and to help us develop our curriculum. We develop the rationale and design of our STEM curriculum collegiately. We are learning to weave sciences, technologies, engineering, mathematics and digital skills together. We are trying new pedagogies to develop STEM skills for learning, life and work through play and active learning.	1 2 3 4 **5** 6 Our next steps: Continue to build partnerships with outside agencies to further create opportunities for learning in STEM.	We have a strong rationale and shared vision for STEM. STEM is effectively embedded across the four contexts of learning. Collegiate working across STEM staff, colleges and employers, ensures coherent curriculum planning, progression and learner pathways. Our STEM curriculum is creative and motivating and aligned to learners' aspirations and labour market needs. Curriculum developments are planned with stakeholders including our local college and employers. Children develop play and practice skills in STEM.

Starting out		Features of highly-effective practice
QI 2.3 Learning, teaching and assessment. Our STEM pedagogy is developing and we are exploring how different environments and approaches can be used to motivate and engage learners. Staff share successes and practice to enhance learning and teaching and ensure a more consistent approach. We are starting to engage with the *Benchmarks for Assessment* and are reviewing the way we gather and moderate evidence to monitor and track learners' progress in STEM.	1 2 3 4 **5** 6 Continue to create new contexts for learning through STEM afternoons and YSL programme.	STEM pedagogy promotes inquiry-based, experiential and challenging learning that reflects the needs and interests of learners. Creativity, curiosity, investigation, invention, discovery and problem solving are enhanced through STEM. A range of evidence is gathered to assess progress and to provide high-quality feedback to learners. The *Benchmarks for Assessment* are being used to support moderation of STEM across all ages and stages. We monitor and track learners' progress across STEM using robust evidence.
QI 2.5 Family learning. Families are being consulted to better understand their needs and aspirations in relation to STEM. We are reaching out to parents to involve them in our STEM planning, events and activities. Colleagues from our learning community, including early learning and childcare, are sharing approaches to parental and family engagement.	1 2 3 4 **5** 6 Our next steps: Very lucky to have some parents in STEM careers and showing pupils what is possible – more opportunities for this through Family Engagement.	Family and parental engagement is integral to our STEM activities, events and communications. This is helping to build STEM capital. The diversity of the STEM workforce and the value of different STEM pathways are promoted to families, especially to those facing barriers to STEM employment (SIMD/ deprivation, ethnicity, disability, gender and care-experienced learners).

Leadership in STEM

Social Enterprise Academy Award & NL Progression Pathway Award

2 teachers have led our Social Enterprise Committee and DYW Committee. Over the past year, both groups have been recognised for their efforts and learning. The Social Enterprise Committee were awarded 'Best Presentation' from the Social Enterprise Academy for their Eco-friendly Bath Bombs enterprise. Their enterprise was child-led. The DYW Committee were the 2nd school in North Lanarkshire Council to be awarded the NL Progression Pathway Award for their efforts and learning around developing the young workforce and providing opportunities to engage with employability skills development. This involved STEM based skills.

STEM family learning

STEM Family Learning Opportunities 2023 - 2024

Dates	Activities	Who
Nov 2023	STEM/Digital After-School Club with families	Mr. Paterson and Digital Leaders
Jan 2024	Digital Skills – Intergenerational Project	Mr. Paterson and Digital Leaders
March 2024	STEM Family Afternoon	Whole School
May 2024	Young STEM Leaders – STEM @ Home	Mr. Paterson and Young STEM Leaders

List of events for our families.

STEM family learning

Home School Partnership Projects

Primary 4	Family Love Respect	Design and make a bedroom from the Titanic

Primary 3 learners will create a model of planet Earth with their family as part of our Home School Partnership Projects.

Primary 3	Gratitude Responsibility Respect	Create a model of planet Earth, the moon and the sun. The model can be used to assist children in: • describing the pattern of movement of the sun and moon over time. • describing how the Earth spins around its axis in 24 hours resulting in night and day. • describing how the tilt of the Earth on its axis as it circles the sun causes the seasons and changes the number of daylight hours over the course of a year.

STEM family learning

Sophie getting in lots of practise for STEM club. 👌 Great to see the children carrying on their learning at home. Well done. 👏👏 @STEMglasgow @STEMLearningUK

The P6 bubble and P6 learning at home have been doing a variety of different STEM Challenges this week. From ice cube necklaces to origami boats that float on water and much more! #STEM @STEMscotland @YoungSTEMLeader

We share STEM Family Learning opportunities on our school Twitter

Opportunities for STEM at home with families.

Balmalloch Primary
@balmalloch

STEM at home. 💥🌍

STEM Learning @STEMLearningUK · Mar 31, 2020

From bouncing eggs to coding without computers, our primary specialist has put together a selection of simple STEM activities that are perfect for children to do at home 🏠 bit.ly/2UPbzwp

STEM LEARNING

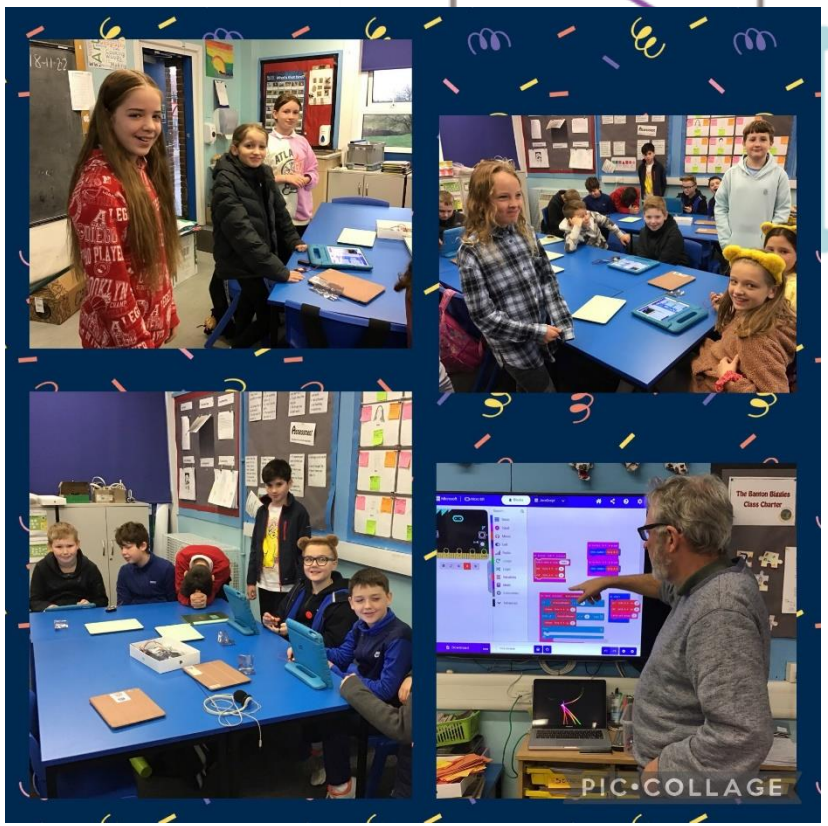
Simple STEM activities to do at home

A selection of activities that are fun and involve little input from parents.

ALT

Employability and STEM partnership working

- Over the past few years, we have hosted a STEM Week in school. The week, organised by the Young STEM Leaders, allows all classes to take part in a variety of different STEM Learning Experiences and hear from speakers across different STEM careers.
- P7 Transition – Our P7 learners visit Kilsyth Academy for a morning to engage with the Technology and Home Economic Departments who provide fun and engaging learning opportunities.
- In partnership with Kilsyth Academy and a local engineering company, BAM Nuttall, we have implemented a Skills Framework.
- We have supported our cluster schools with STEM. Our Digital Leaders have visited cluster schools to share their digital learning and to share ideas. Our Young STEM Leaders and Digital Leaders support Nursery to P1 Transition with visiting our Nursery once a month. Both pupil voice groups plan and implement their own ideas for a STEM learning experience for our Nursery learners.



Digital Leaders in the Cluster

Our Digital Leaders visited a Cluster school to learn more about using micro:bits.

Employability and STEM partnership working

Balmalloch Primary @balmalloch · May 23, 2022

As part of Developing the young workforce week last week, P6 enjoyed a very engaging talk from Taciana who works for **BAM Nuttall**. The children learned about civil engineering from design to construction before designing and building skyscrapers to meet a given criteria 🌆🔨👷👷

What a week for P4A and P4B! We have had visits from a solicitor, chemistry teacher and dogs trust. We were also very generously gifted some merchandise from one of our parents who is a site manager for @CALAHOMES! Thank you to all our amazing visitors this week! #DYWBalmalloch

P2A and P2B would like to thank Kirsty for coming in today to talk about her job as a nurse! The children really enjoyed learning more about their eyes.

BAM Nuttall Partnership

- We have used our partnership with a local engineering company, BAM Nuttall, to provide speakers and learning experiences as part of our STEM Week and Developing the Young Workforce Week.
- Through our planning and implementation of a STEM and Developing the Young Workforce Week, we have built partnerships with parents/carers, members of the community and others to provide presentations and learning opportunities.

Employability and STEM partnership working

P7/6 took part in another stem challenge today with @SmartSTEMs . The challenge was to build a paper plate tower with only 5 plates.

SmartSTEMs

Our learners took part in a STEM Session from SmartSTEMs that involved a STEM Challenge.

Nursery to P1 Transition

Our Digital Leaders and Young STEM Leaders visit the Nursery monthly to support transition to share their learning. Here they are teaching the Nursery children to code a robot.

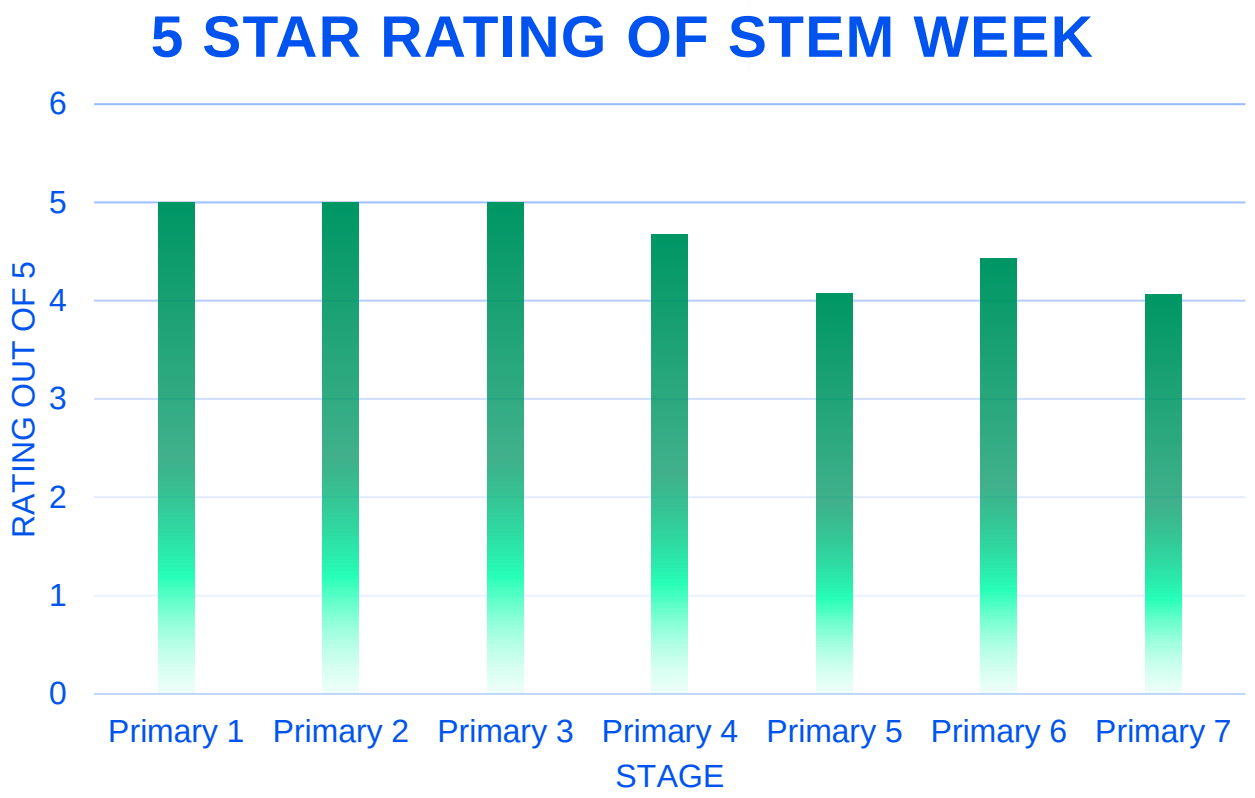
Employability and STEM partnership working

K'Nex Cluster Competition

Balmalloch was delighted to host the Kilsyth Cluster K'Nex Competition. It was a testing challenge, judged by members of Kilsyth Rotary.

Learner Survey

Responses were gathered from learners about STEM Week. An average rating out of 5 from each stage is shown in the chart.



Employability and STEM partnership working

STEM Ambassadors in Scotland
@ScotSTEMAmb

Another great face to face training session yesterday thanks to our new Marty robot resources from @RoboticalLtd

Absolutely brilliant to see our Ambassadors working alongside @YoungSTEMLeader to master Marty and plan activities.

Thank you to @balmalloch for hosting us.

SSERC Partnership

Through the Young STEM Leader programme, we have a strong link with SSERC. We hosted SSERC and local STEM Ambassadors to re-launch SSERC face to face training opportunities with a coding session using Marty robots.

A comment from a STEM Ambassador who was involved.

balmallochYSL reposted

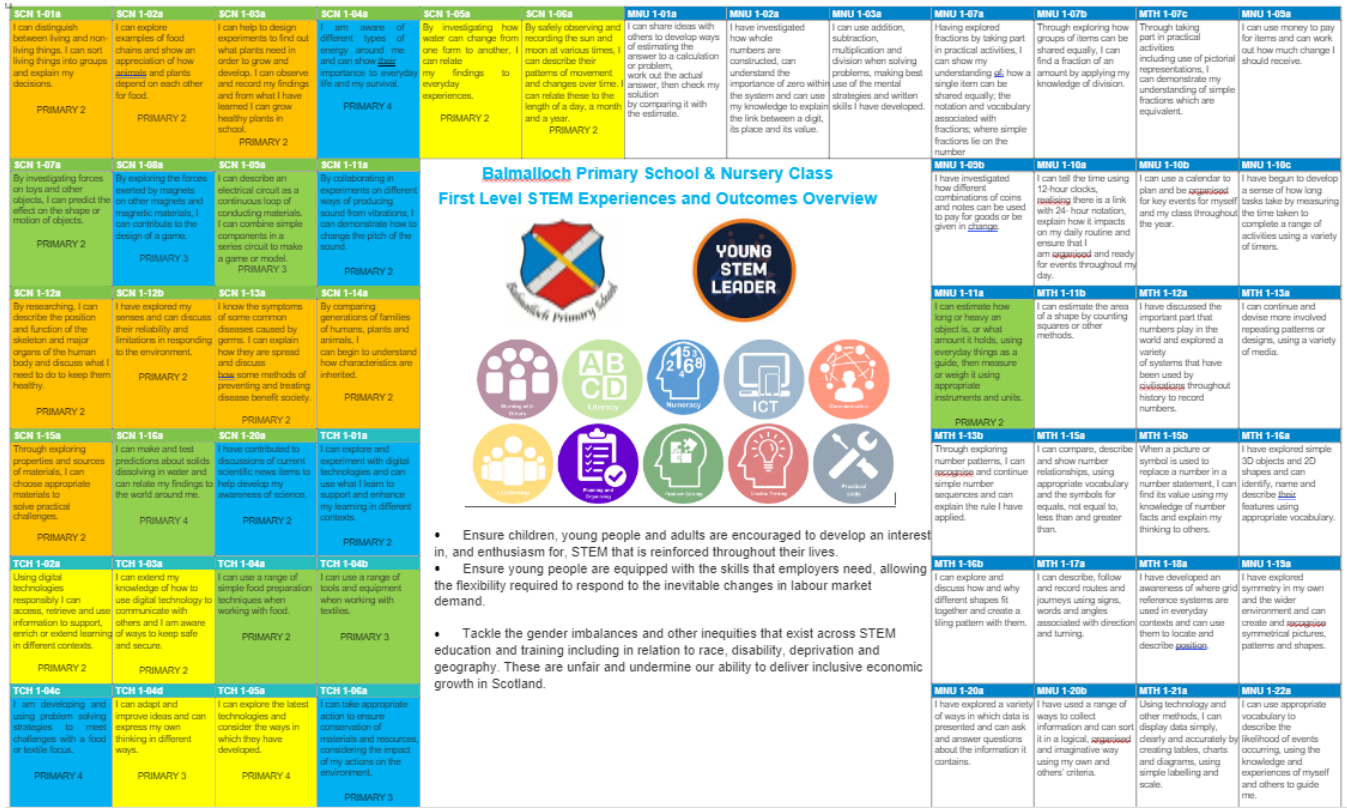
Anne Okafor
@Anne1887

I was super impressed by the Young STEm Leaders ⭐ They were very knowledgeable and came up with some great ideas that will help me in future Marty sessions! Thank you to them all!

STEM curriculum and learner pathways

STEM Planning and Overview

At each level, an overview of STEM Experiences and Outcomes is used for planning in line with our STEM Planners.



Curricular Area/Card	Experience and Outcomes	Benchmarks	Cross Curricular Links
Project One – Guess Which Living Thing	**SCN 1-01a** I can distinguish between living and non-living things. I can sort living things into groups and explain my decisions.	Creates criteria for sorting living things and justifies decisions. Sorts living things into plant, animal and other groups using a variety of features.	Technologies TCH 1-11a Art & Design EXA 1-02a
Project Two – Non-living Tree	**TCH 1-11a** I can explore and experiment with sketching, manually or digitally, to represent ideas in different learning contexts.	Recognises 2D and 3D shapes and how they can be used to visually represent ideas/concepts. Creates manual and/or digital sketches to represent ideas.	Science SCN 1-01a SCN 1-15a
Project Three - Paper Planes	**SCN 1-01a** I can distinguish between living and non-living things. I can sort living things into groups and explain my decisions.	Explains the difference between living and non-living things, taking into consideration movement, reproduction, sensitivity, growth, excretion and feeding.	Technologies TCH 1-11a Science SCN 1-07a
Project Four – A Day in the Life of a Snail	**TCH 1-01a** I can explore and experiment with digital technologies and can use what I learn to support and enhance my learning in different contexts.	Uses digital technology to collect, capture, combine and share text, sound, video and images.	Science SCN 1-01a Literacy LIT 1-09a
Project Five – Recipe for Muffins	**TCH 1-04a** I can use a range of simple food preparation techniques when working with food.	Demonstrates a range of practical skills when preparing foods for example washing, using a peeler, juicing, grating, cutting, simple knife skills (claw grip/bridge hold).	Literacy LIT 1-28a LIT 1-29a
Project Six – Designer Shoe	**TCH 1-09a** I can design and construct models and explain my solutions.	Creates and justifies a solution to a given design challenge considering who is it for, where and how will it be used.	Technologies TCH 1-10a
Project Seven – Living Things Twister Game	**SCN 1-01a** I can distinguish between living and non-living things. I can sort living things into groups and explain my decisions.	Explains the difference between living and non-living things, taking into consideration movement, reproduction, sensitivity, growth, excretion and feeding.	Technologies TCH 1-11a TCH 1-01a

STEM curriculum and learner pathways

Creating a Fictitious Animal Life Cycle

Building a Zoetrope

STEM Afternoon

All classes engage in a weekly STEM Afternoon in response to the STEM Week survey where learners wanted a STEM learning experience weekly.

STEM curriculum and learner pathways

Floating and Sinking linked to Titanic Topic

Creating an Owl Mask

Planning and building a bird's nest

STEM curriculum and learner pathways

Outdoor Learning Activities

A scavenger hunt and participated in outdoor cooking. We made toast, omelettes, toasted marshmallows and even hot chocolate.

We built dens, toasted marshmallows and were shown how to light a fire during bushcraft.

Sustainability

As part of P3b Food Around the World topic and sustainability learning - growing seasonal fruit and vegetables to reduce waste - we wrote instructions on how to make our own strawberry ice cream and even made it during a cookery session. It was delicious

STEM curriculum and learner pathways

Balmalloch Primary School and Nursery Class

STEM Week – Primary 7

Monday		Tuesday		Wednesday	
Spheros Obstacle Course **TCH 2-13a** I understand the operation of a process and its outcome. I can structure related items of information.		**Eggs for Breakfast** **SCN 2-15a** By contributing to investigations into familiar changes in substances to produce other substances, I can describe how their characteristics have changed.		**Simple Wind Turbine** **TCH 2-09a** I can extend and enhance my design skills to solve problems and can construct models.	
Cross Curricular links – TCH 2-01a – use digital products EXA 2-06a – design problem		Cross Curricular Links – SCN 2-15a – changing materials TCH 2-04c – solve problems		Cross Curricular Links – EXA 2-06a – design problem SCN 2-04b – renewable energy	
Thursday		**Friday**		**Speakers/Session**	
Winter Hibernation News Report **TCH 2-11a** I can use a range of graphic techniques, manually and digitally, to communicate ideas, concepts or products, experimenting with the use of shape, colour and texture to enhance my work.		Toothpick Tower **TCH 2-09a** I can extend and enhance my design skills to solve problems and can construct models.		Engineering 	Automata 
Cross Curricular Links – LIT 2-09a – share information, processes, ideas SCN 2-01a – adaptation TCH 2-01a – use digital products		Cross Curricular Links – EXA 2-06a – design problem TCH 2-10a – properties and uses of materials		Kilsyth Academy 	

STEM Week – Primary 7

I can extend and enhance my design skills to solve problems and can construct models. TCH 2-09a

My challenges were –

Toothpick Tower

Draw the model tower you made below -

What challenges did you face when planning, designing and building your tower? List them below and how you overcome such issues -

Self-Assess using Traffic Lights if you achieved these benchmarks.

Experience and Outcome	Benchmarks	Traffic Light
I can extend and enhance my design skills to solve problems and can construct models. TCH 2-09a	Uses a range of methods to join and strengthen materials.	
	Evaluates solutions and explains why they are or are not suitable	

Give an overall evaluation of your STEM Week -

STEM Week

Each stage was provided with a interactive STEM Week timetable with STEM Learning experiences and speakers from STEM Careers. Learners completed an assessment task linked to an Experience and Outcome before self-assessing their achievement of the Benchmarks and providing an overall written evaluation of their STEM Week.

Equity and equality in STEM

Education City Training

Training for staff has supported planning, learning, teaching and assessment to ensure equity across learners. During the inset day, it gave staff members an opportunity to engage with the company and each other to ensure the best value from this resource.

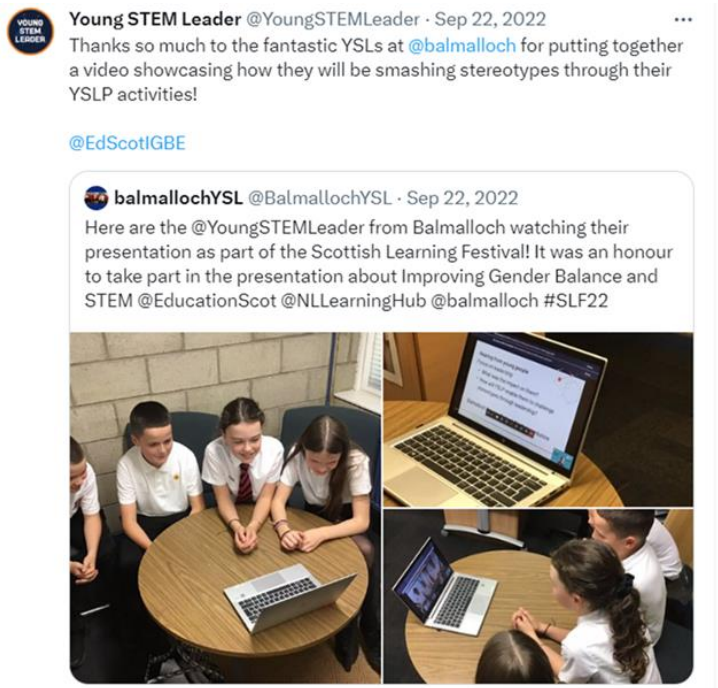
Young STEM Leader Group

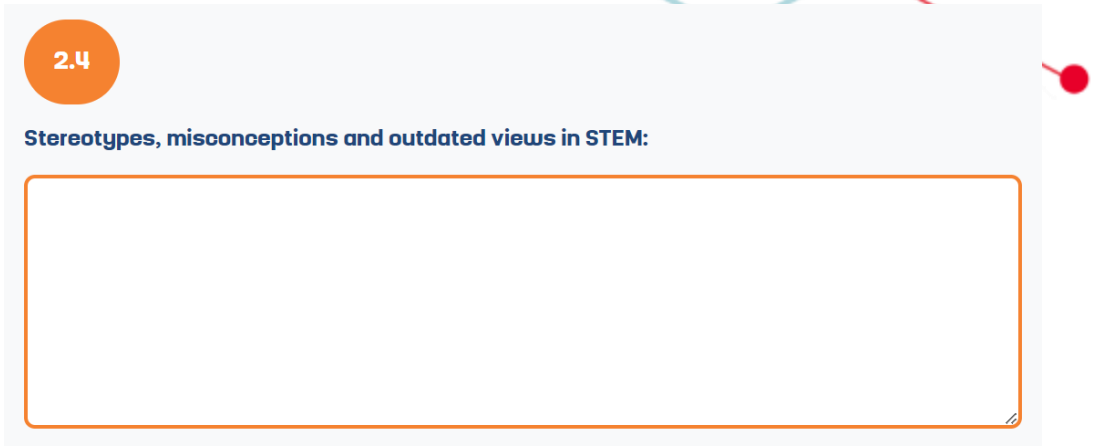
When forming our group annually, learners apply through an application process. Learners from SIMD 1/2, PEF learners and girls are the focus when forming the pupil voice group.

PEF Budget

Part of the PEF Budget has been spent on updating digital technologies in the school to allow equality and equity in access to digital technologies and learning. Some devices have been loaned to families for digital access at home.

Equity and equality in STEM





Scottish Learning Festival 2022

Our Young STEM Leaders created a presentation during Scottish Learning Festival about Improving Gender Balance and STEM to be shared with attendees of the learning festival by video.

Young STEM Leader Log

As part of the Young STEM Leader programme, when completing the Inspire Module, our Young STEM Leaders consider stereotypes, misconceptions and outdated views in STEM and how we can challenge them. Their learning is shared at a whole school assembly.

Equity and equality in STEM

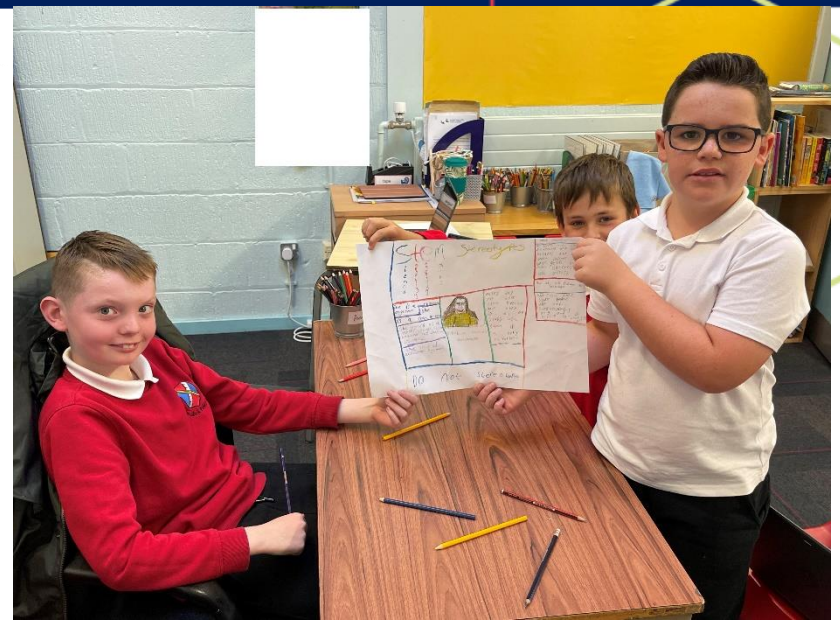
DIGITAL XTRA GRANT

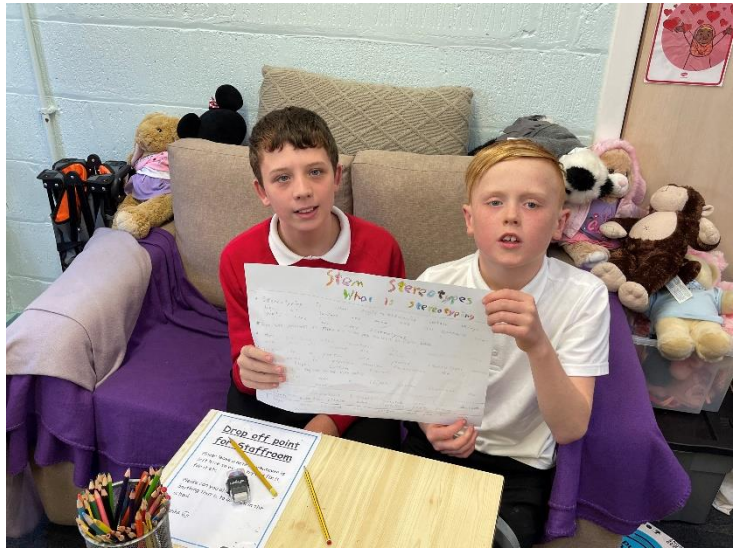
"Digital technologies are utilised across the setting from nursery through to P7, with consideration given to the appropriate application of resources and approaches."

Digital Xtra Grant

To ensure equity and equality in STEM, we applied and secured funding from the Digital Xtra Grant. This has allowed equity for all learners with access to digital learning and technologies with resources and approaches differentiated to meet the needs of our learners.

Equity and equality in STEM





Stereotypes & Misconceptions

YSLs discussed stereotypes and misconceptions in STEM and how we might challenge them. We learned about Krystina Pearson-Rampeearee and how she is smashing stereotypes. We created information posters to share with others too!

Equity and equality in STEM

Progress	Reading Age End of Term 2	Reading Age End of Term 3	Reading Age End of Term 4	Spelling Age End of Term 2	Spelling Age End of Term 3	Spelling Age End of Term 4
Progress of a year and or above	8%	6/81 - 7%	6/81 – 7%	14%	10/81 – 12%	4/81 – 5%
Progress between 6 months and a year	20%	19/81 -24%	19/81 – 24%	28%	22/81 – 27%	19/81 – 24%
Progress between 1 month and 6 months	47%	33/81 – 40%	38/81 – 47%	32%	22/81 – 27%	37/81 – 46%
No Progress	18%	24/81 – 29%	18/81 – 22%	24%	27/81 – 33%	21/81 – 25%

IDL Spelling and Reading Intervention

With using some of the PEF Budget to buy new digital devices, learners have developed their digital skills. This has enhanced the use of the IDL Spelling and Reading Intervention to improve attainment. The data above shows the progress across the school during 2022 – 2023 for progress in Spelling and Reading Age. 81 pupils engage in this intervention through the use of a laptop or iPad bought from PEF Budget.

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STEM Nation