Cleveden Learning Community
STEM Policy

Rationale:

Our vision of STEM across the Cleveden schools cluster aligns with the key outcomes of the STEM Strategy and Training Strategy for Scotland (2017) where everyone is encouraged and supported to develop their STEM skills throughout their lives, enabling them to be inquiring, productive and innovative, in order to grow STEM literacy in society and drive inclusive economic growth.

There are four key aims:

• to build the capacity of the education and training system to deliver ***excellent*** STEM learning so that employers have access to the workforce they need;

• to close ***equity*** gaps in participation and attainment in STEM so that everyone has the opportunity to fulfil their potential and contribute to Scotland's economic prosperity;

• to ***inspire*** children, young people and adults to study STEM and to continue their studies to obtain more specialist skills; and

• to ***connect*** the STEM education and training offer with labour market need – both now and in the future – to support improved productivity and inclusive economic growth.

STEM Education and Training Strategy for Scotland 2017

In setting out this policy a number of key documents were consulted:

Curriculum for Excellence, Principles and Practice

Science Benchmarks, 2017

STEM Education and Training Strategy for Scotland, 2017 and *associated reports*

Primary Science Capital Teaching Approach

Planning & Resources:

Schools follow the STEM Glasgow Sciences Framework to ensure there is coverage of the curriculum and progression of knowledge and skills.

Teachers will follow the RAiSE Planners for each outcome, but can add additional activities where appropriate. Children should be involved in the planning process and be given the opportunity to explore areas of STEM that interest them.

Schools have access to the SSERC resource boxes to support teaching across the curriculum.

There are a range of STEM resources on the Cleveden Cluster Padlet.

Learning and Teaching Approaches:

How we teach STEM is important and staff should consider the most appropriate teaching approaches for any particular lesson.

As much as possible STEM teaching and learning should be practical and give children opportunities for hands on experiences. Interdisciplinary opportunities are important to contextualise STEM and children should be encouraged to explore how what they are learning is relevant to their lives and the world around them. Play pedagogy is central to our children's learning throughout their education and STEM offers almost limitless opportunities for children to learn through directed and free play.

Many STEM topics lend themselves to outdoor learning and outdoor space should be utilised throughout the year in all weather.

Enquiry based learning gives children the opportunity to ask their own questions and propose methods to find answers. Every year children should experience each of the types of Science Enquiry (find out more here) including the opportunity to research. Cluster schools already use the Making Thinking Visible approach which can be applied across the STEM curriculum.

STEM Skills Development:

As well as the knowledge part of the STEM curriculum it is important that children are given suitable opportunities to develop a wide range of STEM skills across different disciplines. Literacy and Numeracy skills should be embedded in STEM teaching, especially subject specific vocabulary and links between subjects should be highlighted. Children should be given opportunities to develop their technology, engineering and digital literacy skills and then be able to use them in different contexts.

Children should have access to appropriate STEM related books and opportunities to read about STEM in the news and the impact that the latest developments have. STEM a Story, Topical Science Updates and Teaching Science Through Stories are all excellent resources to let children explore STEM through a variety of stories.

Teaching STEM should provide opportunities for children to develop their meta skills; Self-management, Social Intelligence and Innovation. Details can be found in the Skills Development Scotland Progression Framework.

Assessment and Reporting:

Assessing STEM knowledge and skills lets staff gauge children's progress and plan next steps effectively. The rationale for focussed assessment is outlined in Building the Curriculum 5.

Where assessment grids are used they should record progress of skills and knowledge across the curriculum. Additional progress information can be collected from low stakes knowledge quizzes, investigation write ups, floor books and children recording their ideas and learning in jotters.

The RAiSE planning documents have ideas for assessment built in and the TAPS resource has lots of ideas for specific assessment activities, including a Scotland specific section.

Staff should aim to report to parents and carers on children's progress in, and aptitude for, STEM at least once in an academic year.

STEM Capital:

Schools should look for ways to develop the STEM Capital of their children – Primary Science Capital Teaching Approach. Taking part in the Young STEM Leaders programme really develops children's engagement in STEM. Finding ways to engage parents and carers is important, whether that is involving them in home learning tasks, inviting them into the school or engaging them in DYW activities. Work with the schools DYW coordinator to make links with organisations such as Enable Scotland.

Taking part in whole school events such as British Science Week and The Great Science Share inspires children to engage with STEM in different ways and collaborate on projects.

Children should have an opportunity to explore jobs and careers that have links to STEM and that use aspects of STEM in them. Schools should look for opportunities to have STEM related visitors into school to talk to children (STEM Ambassadors; Skype a Scientist; SmartSTEMs UoGCOG) and opportunities for STEM related trips for children – Glasgow Science Centre. STEM Careers resource

Sustainability:

Children have a right to learn about the sustainability of our planet and the causes, science and effects of climate change across the world. Staff should look for opportunities to link sustainability to the STEM they are teaching and where possible incorporate the Sustainable Global Goals. Transform Our World run an annual online World Youth Summit with sustainability linked content for all ages.

Pupils with Additional Support Needs (ASN):

All pupils should have access to the same STEM provision and be supported in any way they need to be able to fully access the curriculum. Staff should take into account the needs of all pupils when planning.

Staff should be aware of biases and inequalities with in STEM careers and STEM education. Gender and race biases exist across most of the STEM landscape and must be challenged from early primary upwards. There has been extensive research done by the Institute of Physics and the ASPIRES project and Education Scotland have established an Improving Gender Balance and Equalities team who have produces some excellent resources for schools.

Roles and Responsibilities:

Cluster STEM Leadership

- Carry out a regular staff CLPL needs analysis and develop a cluster programme of targeted CLPL opportunities for all staff.
- Audit resources annually and update and replace as necessary.
- Oversee effective transition from nursery to primary and primary to secondary, possible STEM transition programme and transfer of information relating to pupils' progress in STEM.
- Audit the Progression Framework regularly and ensure it is fit for purpose across all cluster schools, update as necessary.
- Undertake an annual review of this STEM policy and update as necessary.

School Leadership

- Ensure all staff are aware of this STEM policy, have access to it and are following it when planning, teaching and assessing STEM.
- Monitor the provision of STEM across the school providing support for staff where necessary.
- Keep school staff up to date with STEM news, CLPL opportunities, new resources and upcoming STEM events.
- Evaluate the impact of STEM provision across the school – the STEM Self Evaluation tool is excellent for this.
- Ensure all STEM activities are carried out safely in accordance with the schools H&S policy. Contact SSERC for specific advice on H&S where necessary.

Teacher Responsibility

- Plan and deliver the STEM curriculum using the STEM Glasgow Sciences Framework and the RAiSE Planners.
- Make relevant links between STEM and Literacy, Numeracy and Health & Wellbeing.
- Make links to careers that use STEM skills.
- Challenge all stereotypes and encourage children to be inquisitive critical thinkers.