Primary Science Teaching Trust

Context

Assumptions

Summary

We support:

SCHOOL LEADERS

TEACHERS

STAKEHOLDERS

COLLEGE FELLOWS

The Primary Science Teaching Trust's vision is to see excellent teaching of science in every primary classroom in the UK


SCHOOL LEADERS
Science Subject Leaders
Subject leaders are enthusiastic, confident and competent to lead science in their schools.
Senior Leadership Teams
Senior Leadership Teams value science as a core subject and ensure that it has sufficient and regular teaching time.

Science Subject Leaders

ACTIVITIES

PSTT offers:

- Science audits for schools
- 1:1 guidance to a science subject leader and professional development to groups of subject leaders
- Support for science subject leaders to deliver training or run engagement activities within their school
- Support for science subject leader to collect impact data about the attitude of teachers and children with their school
- Newsletter and regular updates for science subject leader
- Guidance for schools about other programmes and opportunities for PD, e.g., PSQM

OUTCOMES

1. Science subject leaders are more confident to identify their schools' needs.
2. Science subject leaders are more effective at embedding approaches to meet needs.

OBJECTIVE/IMPACT

Science subject leaders are enthusiastic, confident and competent to lead science in their schools.

Senior Leadership Teams

ACTIVITIES

PSTT offers:

- Engagement with senior leadership teams in Priority Area schools
- Guidance and webinars for senior leadership teams in all schools to develop and embed science
- Guidance for school governors on how to monitor and support science in their school

OUTCOMES

1. Schools ensure that science is more embedded as a core subject.
2. Schools are more ambitious for children to develop an identity with science.

OBJECTIVE/IMPACT

Senior leadership teams value science as a core subject and ensure it has sufficient and regular teaching time.


TEACHERS
All teachers
All teachers deliver practical and engaging science lessons that are relevant and accessible to all children.
Student and early career teachers
Teachers start their careers feeling empowered and inspired to deliver excellent science lessons.

All Teachers

ACTIVITIES

PSTT offers:

- Up-to-date, relevant classroom resources for teaching, learning and assessment
- Annotated video exemplars of excellent classroom practice
- Professional Development (PD) courses, online and face-to-face
- Bespoke PD, including supported self-evaluation and audits of schools' needs
- Support for teachers with developing evidence-based practice
- Up-to-date information for teachers about developments in primary science (through mailings, social media and our website)

OUTCOMES

1. Teachers are more able to understand what constitutes excellent science teaching and learning.
2. Teachers are more able to plan and deliver excellent science lessons.
3. Teachers are more able to reflect on their own practice to identify areas for development.
4. Teachers are more able to access and implement relevant PD and resources.

OBJECTIVE/IMPACT

Teachers deliver practical and engaging science lessons that are relevant and accessible to all children.

Student and Early Career Teachers

ACTIVITIES

PSTT offers:

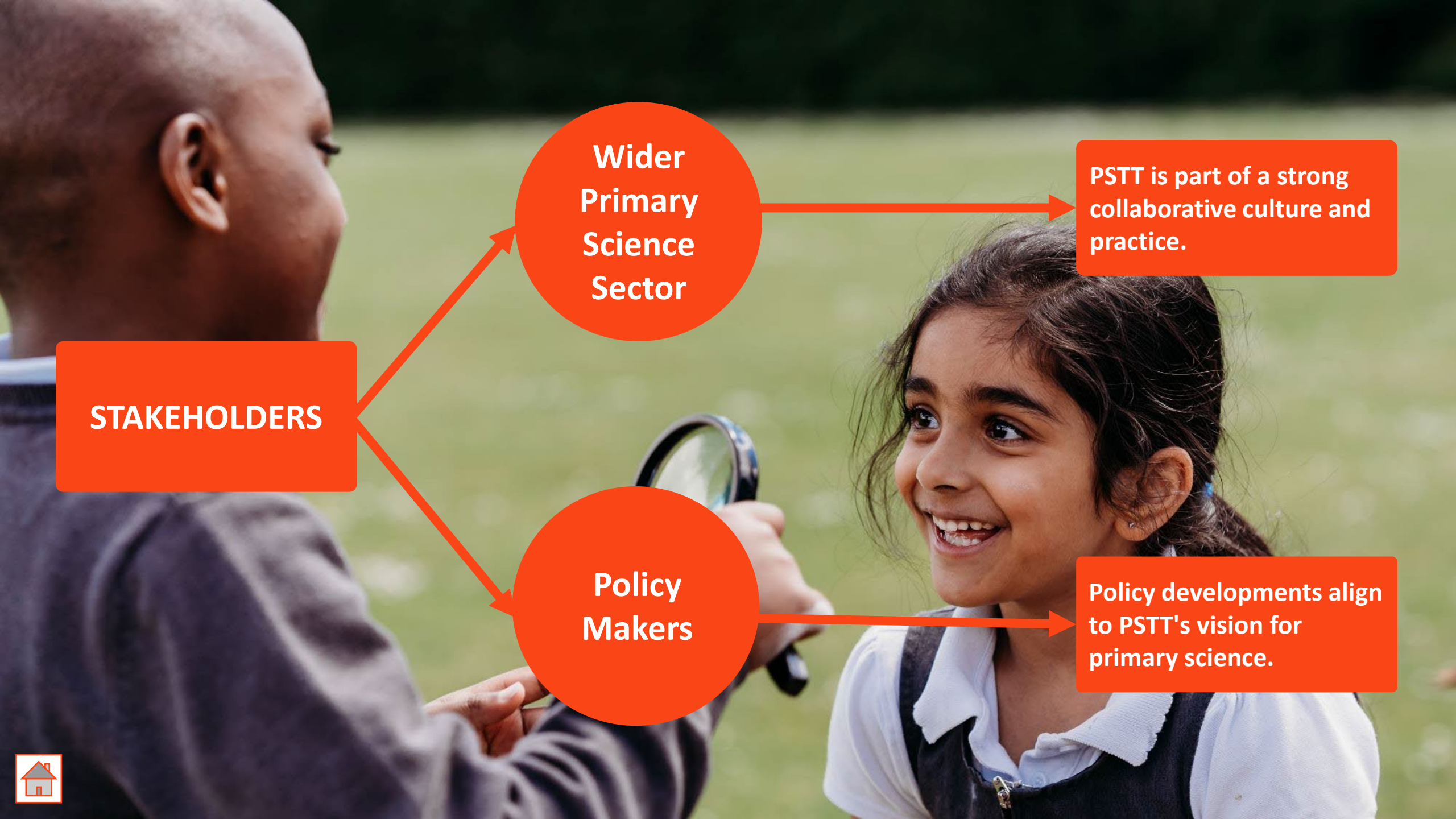
- Primary Science Enhancement Award for student teachers and Early Career Teacher groups
- Reviews of Initial Teacher Education (ITE) programmes
- Bespoke Professional Development (PD) sessions to ITE providers
- PD in science for school placement class teacher mentors

OUTCOMES

1. ITE providers offer sufficient expertise, time and opportunities for science.
2. More teachers start their careers with good science subject knowledge and pedagogical understanding.
3. More teachers start their careers ambitious and confident to take up leadership roles in science.

OBJECTIVE/IMPACT

Student and Early Career Teachers start their careers feeling empowered and inspired to deliver excellent science lessons.


STAKEHOLDERS
Wider Primary Science Sector
Policy Makers
PSTT is part of a strong collaborative culture and practice.
Policy developments align to PSTT's vision for primary science.

Wider Primary Science Sector

ACTIVITIES

PSTT will:

- Play a key role in collaborative projects and initiatives in the sector
- Use up-to-date research from the wider sector to inform its decisions
- Publish findings from our own work in peer-reviewed journals and our website
- Share findings at events and conferences

OUTCOMES

1. Our sector develops a better shared understanding of 'what works' in primary science.
2. PSTT's voice in primary science is more visible to others in the sector.
3. Schools are better able to access guidance and support about best practice in primary science.

OBJECTIVE/IMPACT

There is a strong collaborative culture and practice across the primary science sector.

Policy Makers

ACTIVITIES

PSTT will:

- Meet with and make presentations to policy makers
- Work with wider sector partners to produce policy papers

OUTCOMES

1. Education policy better reflects the importance of primary science.
2. Science curricula better reflect current research and best practice.

OBJECTIVE/IMPACT

Policy developments align to PSTT's vision for primary science.

COLLEGE FELLOWS

PSTT College Fellows make a positive difference to primary science beyond their schools or contexts.

PSTT Fellows

ACTIVITIES

PSTT offers Fellows:

- An even stronger community of practice through more Primary Science Teacher Awards
- A regular College Conference
- A range of opportunities to continue their own Professional Development (PD)
- Area and network meetings that reach out beyond Fellows
- Development pathways for Fellows to deliver PD or mentor others
- Projects and opportunities for new resource development

OUTCOMES

1. Fellows are increasingly active with developing and disseminating excellence in primary science.
2. Fellows are more widely recognised as ambassadors for excellent primary science.

OBJECTIVE/IMPACT

Fellows make a positive difference to primary science beyond their schools or contexts.

CONTEXT
Primary science faces many challenges across the UK

Teaching and Learning

Children's science learning can be superficial, lacking challenge and depth[2,4]. Only about half of students (ages 11-13) may feel that primary school had prepared them well for learning science at secondary school[18]. Some children have gaps in their knowledge and conceptual development because of the Covid 19 pandemic[19].

Curriculum

Careful curriculum design is essential to ensure continuity and progression between year groups but in some primary schools, science is taught as a series of disconnected topics and practical work does not always develop subject knowledge or enquiry skills[9,10]. Schemes of work, when used are, not always adapted to suit the needs of the pupils.
Each of the four nations in the UK have their own curriculum with differing emphasis on knowledge, skills and relevance to locality. This can make it difficult for organisations to produce resources and offer Professional Development that suit all teachers.

Science Leadership

The attitude of the headteacher, principal teacher, leadership team or science subject leader in science can be instrumental in whether (or not) science has a high profile in a school[17]. Science subject leadership is a necessity in primary schools[12]. However, this can be challenging because not all subject leaders have dedicated leadership time[15,17]. Also, because there is often a regular turn-over of science leaders, there can be a lack of stability in schools for science that results in limited progress and improvement[20].

Teacher competency and confidence

Few primary teachers hold specialist science degrees[11]. In some countries no formal science qualification is needed to become a primary teacher[14]. Many primary teachers do not feel confident or competent teaching science[15]. Teachers report that a lack of confidence can have an impact on whether teachers choose to deliver practical hands-on investigations[17]. Practitioners working in early learning and primary settings may not recognise the learning they are leading as being science or STEM-related.[14]

Timetabling for science

There is concern that science is being squeezed out of the primary school curriculum[4,9]. The amount of time allocated to science varies widely between countries in the UK – some classes are not receiving two hours weekly science teaching, and some receive no weekly science lessons[15]. Some pupils have entire half terms without learning science[10].

Professional Development

Many primary teachers do not receive regular professional development in science teaching[15]. It is widely recognised that professional development should be planned for and have a clear purpose related to the needs of the whole school[4,13]. Few schools plan continuing professional development for developing teachers' subject knowledge of science or how to teach it[10].

Initial Teacher Training

There are many ways to become a qualified primary teacher in the UK. However, across all routes not enough time is dedicated to science[14,16]. It is not uncommon for primary trainee teachers to have only a handful of sessions dedicated to science. This can lead to a lack of knowledge and lack of confidence when teaching and assessing science.

Assessment practices

In some schools, assessment practices may be inaccurate and over-generous[4], and may focus only on subject knowledge[10]. Assessment does not inform teaching, leading to insufficient response to pupil needs[2,10].

Children's perceptions of science

Many children enjoy science but feel that science is not 'for me', particularly those from minoritised communities[1]. Students need learning experiences that are engaging and seen as relevant to their lives[5]. Possible factors responsible for children's negative perceptions of the value of science are an over-crowded and over-detailed curriculum, teaching of disconnected facts, and insufficient learning of science through enquiry (an approach that involves students working in ways that are similar to those of scientists)[6]. Sharing and implementing the Primary Science Capital Teaching Approach[8] across the UK could promote and increase children's engagement and identification with science[7].

Primary Science Teaching Trust

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The context described draws on evidence from:

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16. Wellcome Trust (2017) ***'The science content in primary Initial Teacher Training (ITT).*** The Wellcome Trust.
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20. Wellcome Trust (2021). ***Primary science education beyond 2021 – what next*?** The Wellcome Trust.

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ASSUMPTIONS

PSTT assumes that target groups will engage with PSTT activities

Leaders

Senior Leaders value science sufficiently to prioritise it for development

Senior Leaders will release staff for professional development

Subject Leaders choose to engage with PSTT (or partner organisations)

Subject Leaders have time to reflect and work with teachers in their school

Teachers

Teachers implement the resources and strategies learned through professional development

Teachers reflect on the impact of new resources and strategies on children's learning to improve their practice

There is more engagement and participation from minority groups

Stakeholders

Partners provide high-quality PD and resources

Partners share/promote training opportunities

Fellows

Sufficient College Fellows support the delivery of PSTT national and regional programmes

Fellows can be released from their schools / other work

ENABLERS

PD providers listen to their audiences' needs

Experience/proven track record of delivery in schools

Funds available for Priority Areas

PSTT support is relevant to the needs of audience

High quality pre-existing materials

BARRIERS

Schools may not have funding for science PD

Entrenched attitudes towards science teaching

Few presenters are from minority groups

No time for staff to take part in PD

Poor school community buy-in

Primary Science Teaching Trust

Challenges faced by UK primary schools

Science is not always allocated sufficient curriculum time and some children have entire half terms without any timetabled science. Curriculum design for science is not always coherent.

Children's science learning can be superficial, lacking challenge and depth. Many children do not see themselves as scientists.

Assessment practices do not always inform teaching, leading to insufficient responses to children's needs.

Few primary teachers are science specialists and some lack subject knowledge and/or confidence. Commonly, student teachers have a limited amount of input that is dedicated to primary science.

Few schools have a clear plan for how to develop teachers' knowledge of science and how to teach it. For many schools, professional development for teachers in science is not a priority. Not all science subject leaders have dedicated leadership time.

At the Primary Science Teaching Trust our activities are focused on outcomes for four groups: school leaders, teachers, stakeholders and our College Fellows

School Leaders

Subject leaders and senior leadership teams value science and are enthusiastic, confident and competent to lead its development

Activities

- Bespoke support and mentoring for science subject leaders
- Guidance and professional development for senior leadership teams and governors

Outcomes

Science subject leaders are more confident to identify their schools' needs

Science subject leaders are more effective embedding approaches to meet needs

Schools ensure that science is more embedded as a core subject

Schools are more ambitious for children to develop an identity with science

Stakeholders

We collaborate effectively with our primary science **partners**, with a shared voice that supports schools and **policymakers**

Activities

- Increase PSTT engagement with partners and policy makers
- Work with partners to produce guidance for teachers
- Meet with and make presentations to policy makers

Outcomes

Our sector develops a better shared understanding of 'what works' in primary science

PSTT's voice in primary science is more visible to others in the sector

Schools are better able to access guidance and support about best practice in primary science

Education policy better reflects the importance of primary science

Science curricula better reflect current research and best practice

Teachers

At every career stage**, teachers** deliver practical and engaging science lessons that are relevant and accessible to all children

Activities

- Provision of resources
- Provision of professional development across the UK in response to need
- Free provision of professional development to Priority Areas
- Communications with teachers
- Working with initial teacher education providers

Outcomes

Teachers are more able to:

- understand what constitutes excellent science teaching and learning
- plan and deliver excellent science lessons
- reflect on their own practice to identify areas for development
- access and implement relevant professional development and resources

Initial teacher education providers offer sufficient expertise, time and opportunities for science.

More teachers start their careers:

- with good science subject knowledge and pedagogical understanding
- ambitious and confident to take up leadership roles in science

College Fellows

PSTT College Fellows make a positive contribution to primary science beyond their own schools or settings

Activities

- Recognising achievement with Primary Science Teacher Awards
- Developing a strong community of practice

Outcomes

Fellows are increasingly active with developing and disseminating excellence in primary science

Fellows are more widely recognised as ambassadors for excellent primary science

This supports our long-term vision

The Primary Science Teaching Trust's vision is to see excellent teaching of science in every primary classroom in the UK.

Our working definition of excellence can be found here.

Primary Science Teaching Trust