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A Blueprint and Toolkit for School-Based Teacher Development (SBTD)

SECONDARY

A Blueprint and Toolkit for School-Based Teacher Development: Secondary

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The Commonwealth of Learning (COL) is an intergovernmental organisation created by Commonwealth Heads of Government to promote the development and sharing of open learning and distance education knowledge, resources and technologies.

Contents

Acknowledgements

The *Blueprint and Toolkit for School-Based Teacher Development* was developed following the experience of a number of school-based teacher development programmes. Three sources were of particular importance:

- The Commonwealth of Learning is grateful to Dr Caroline Pontefract for permission to use elements of the United Nations Relief and Works Agency (UNRWA) School-Based Teacher Development (SBTD) Programme.

- The Teacher Education in-Sub-Saharan Africa (TESSA) programme, one of the first major open educational resources (OER) for teacher education, is an important source of OER content that has been adapted for the *Blueprint and Toolkit*.

- The TESS-India programme, which built on the TESSA experience, has also been an important source, particularly for the *Key Resources*.

SECTION 1
Introduction

The Commonwealth of Learning (COL) has, for many years, been involved with teacher education in many parts of the world. This _Blueprint and Toolkit_ is for countries and regions wishing to implement school-based teacher development (SBTD) more rigorously to improve the performance of schools and raise the achievements of millions of children and young people.

The Toolkit provides the guidance and supporting resources for a school-based programme of around 12–15 weeks' duration. International evidence suggests that for in-service education to make a difference, it ought to take around 60–70 hours in a fairly constrained time period. This might mean around 5–7 hours a week in school. But it is important to remember that most of the activities in the Toolkit involve classroom applications. In other words, teachers develop professionally at the same time as they are teaching.

The focus of the activities in the Toolkit is on teachers' major tasks depending on the school level. In the Toolkit for primary teachers, questions on literacy and numeracy take up more time than other issues. In this, the Toolkit for secondary teachers, significant attention is given to the link between subject and pedagogic knowledge.

Both Toolkits are focused on the process of SBTD. The aim is to provide a detailed introduction from which schools and teachers can develop further programmes and activities. The activities around literacy, numeracy, subject pedagogic knowledge and other issues are introductory and require further work though ongoing development programmes. The Toolkits contain explicit and implicit attention to teacher values. For example, Question 2 asks: "What makes a good teacher?" and answers are expected that go beyond the confines of classroom competency.

The audience for the _Blueprint and Toolkit_ is primarily primary and secondary schools in developing-country contexts. To this end, COL has drawn on primary and secondary school improvement programmes, particularly those that have produced open educational resources (OER) for teachers. The _Blueprint and Toolkit_ is published as OER and can, therefore, be used and adapted as the user sees fit subject to the Creative Commons licensing process.

The _Blueprint and Toolkit_ is in four sections:

- Section 1: Introduction
- Section 2: Policy Issues in Supporting SBTD
- Section 3: External Support for SBTD
- Section 4: The Teacher Toolkit: Secondary

The _Blueprint and Toolkit_ aims to provide highly focused documentation easily accessible to policy makers and the implementers of teacher development systems. The focus is on schools in developing-world contexts, although evidence, ideas and plans have been drawn from the global literature on teacher development.

SECTION 2
Policy Issues in Supporting SBTD

Education policy makers and educational planners have a daunting task: to make expanding school systems meet the ever-increasing demands for high-quality primary and secondary education. There has been growing international concern about the educational outcomes of school systems in many countries. Despite rapid expansion of provision, the achievements of millions of pupils are well below expectations. This is particularly true in poorer countries in Sub-Saharan Africa and some parts of Asia.

There are significant international initiatives attempting to address these difficulties. The 2015–30 UN Sustainable Development Goals are ambitious in scope. The Global Fund for Education is attempting to target resources where action can be most effective. Our knowledge of educational change suggests that no one action will bring about the necessary improvements. However, everyone is concerned about the quality of teaching in schools and the ways this might be improved. This *Blueprint and Toolkit* contributes to this process, with a particular focus on school-based teacher development (SBTD).

The Case for School-Based Teacher Development

There are many reasons why SBTD should be a core feature of all educational systems. Three of the most important justifications are set out below.

1. Personal and professional development ought to be central to any concept of professionalism. Good teachers are interested in trying new approaches and improving their pedagogic skills. Good teachers want to be up to date about the subjects they teach and the methods they use. Good teachers think and reflect on their practice in an ongoing way, which, inevitably, is a school-based process. An explicit commitment to professional development enhances personal status and identity. Few people would want to consult a doctor or nurse who was not up to date with new treatments and ideas for promoting health. Should teachers, in their chosen field of expertise, be any different?

2. Evidence suggests that the most important influences on teachers are the knowledge and attitudes of a few immediate colleagues. This might be a group of teachers in a small primary school or a subject department in a secondary school. Therefore, teacher-teacher learning is central to SBTD. For many years, school improvement strategies have focused on improved school-based leadership and management of teachers. Professional development is arguably the most significant aspect of this process.

3. The logistics of professional development point inescapably to school-based practices. Deep in some older styles of thinking is the notion that taking teachers away from the classroom is the best way to help them improve. Many education systems still invest very large sums of money in providing "out of school" in-service courses lasting a day, sometimes longer. The large-scale growth of school systems, however, has made it financially and organisationally impossible to continue to do this coherently. There is also substantive evidence that such

strategies do not have an impact on teacher practice — even if logistically feasible, the approach would now be open to question.

The central purpose of the *Blueprint and Toolkit* is to suggest how SBTD can be effectively implemented. The activities and methods proposed have been extensively trialled in different parts of the world.

The capacity to support SBTD has been significantly enhanced by developments in communications technology. COL has been at the forefront of demonstrating how online processes of all kinds can be used for educational purposes. This experience will be drawn on in suggesting how the structures and processes of teacher education can be enhanced by all aspects of online and e-learning.

There have been many analyses of how to improve the effectiveness of school systems. This is now a major concern for politicians and policy makers in most countries. There is a particular urgency in those countries, often defined economically as low or middle income, where the results and outcomes of schooling are poor and nowhere near the standards being reported by international assessment organisations.

Given the high political priority given to school improvements, it is inevitable that governments want to be seen to be taking action. There is nothing wrong with this. There are many ways governments or regional authorities can intervene successfully. But, for many years, analysts of change have been saying that "top down" strategies need to be allied with more on-the-ground, "bottom up" strategies if change is to be successful. The combination of policy development from the top and teacher development at the school level has the potential to improve teacher performance and the achievements of young people in school significantly.

Governments and regional authorities that promote SBTD can learn from the experience of others. Below are ten strategies that are important to the successful implementation of this approach.

Ten Policy Strategies Supporting SBTD

1. **Incorporate SBTD in any policy documentation around in-service training:** Most school systems have a policy statement about professional development. It is important to place school-based approaches at the centre of such a policy. However extensive the "out of school" offering is, school-based approaches must be at the core. It is important to stress the role of school leaders in this.

2. **Explain to teacher leaders and teacher organisations that SBTD is an essential part of any school improvement process:** In some parts of the world, in-service training has become part of a teacher's entitlement. The argument of the SBTD approach is that in-service training external to the school is wholly inefficient unless backed by professional activity at the school level.

3. **Stress the values component of SBTD:** A school-based approach to professional development goes beyond the pedagogic issues of classroom practice. Teachers need to discuss their role in the community, their responsibility to address disadvantage in working with children and young people and the importance of relationships with parents/carers.

4. **Show how SBTD can be introduced:** The *Blueprint and Toolkit* needs to be introduced to school leaders and teachers. There should be a strong expectation that demonstrating how SBTD works and how successful it can be should be part of the tasks and responsibilities of the external school support system (advisors, inspectors, for example).

5. **Have the evidence supporting SBTD to hand, including assessment data:** There is now extensive literature that provides the "evidence base" for SBTD. Those supporting school-based approaches need to understand this evidence fully and be able to present such information to school leaders and teachers in a coherent way. A small but representative sample of the literature is presented below in a form that could be used for policy advocacy.

   However, another form of evidence is also very important. Teachers and schools need data that enable them to assess the progress their students are making. This is one of the pillars of SBTD. Different countries and regions approach this in different ways. However, data collection on progress needs to be collated at the school and class level, as well as at the level of the individual student.

6. **Provide local staff to support SBTD implementation:** School systems have evolved in different ways and on different time lines. Many, however, have in-service programmes that take teachers out of school for formal development opportunities. Some of this may be very valuable (leadership training, for example), but the evidence suggests that taking teachers away from their classes does not improve students' achievement levels.

   Providing modest amounts of outside support can make school-based working very successful. An advisor visiting a school and advising on the use of assessment data or describing how nearby schools have addressed an issue would be an example. Given the pressure on resources, this may mean moving resources from traditional in-service budget headings into school-based support.

   School-based working is likely to lead to improvements above and beyond those obtained by previous forms of in-service training. And, as explained above, the expansion of school systems has made traditional external modes of in-service training impossible to implement logistically.

7. **Create the conditions for online support for SBTD:** Many occupations now use online strategies to provide support at the local level. In many parts of the world, digital learning is being incorporated into teacher development strategies. There is now much literature on this topic. COL recently published a policy document that focused on Sub-Saharan Africa *(Digital learning: Reforming Teacher Education to Promote Access, Equity and Quality in Sub-Saharan Africa)* and there are similar publications covering other parts of the world.

   Online resources that are freely available have been used in the production of the Toolkit. These include, for example, TESS-India and the Teacher Education in Sub-Saharan Africa (TESSA) programme. They can also be used to develop further support at the country or regional level. Teachers in many parts of the world exchange ideas through social-media platforms and this can be encouraged and built into the support structure.

8. **Establish a recognition system for SBTD (Certificates of Completion):** Relatively small professional developments are difficult to build into university-level awards. However, it is possible to set up a "Certificate of Completion" sponsored by an employing authority. This is to be encouraged. You might require teachers to keep a record of activities successfully completed (to be signed off by the school principal, for example). At a local level, such

certificates can be awarded at a ceremony with local community leaders and parents/carers attending. This emphasises the importance of professional development and contributes to enhancing professional status.

9. **Make SBTD part of any inspection process:** Judgements about a school should include the in-school routines of professional development. If SBTD is to be successful, it is important to establish criteria for judgement and incorporate these criteria in any inspection process.

10. **Encourage politicians to support SBTD:** Ministers, educational leaders and others within the political and governance structure can be encouraged to stress the importance of SBTD. A theme that could be stressed is the importance of teachers — like doctors, nurses and other professionals — taking part in work-based development.

Evidence to Support the Promotion of SBTD: A Brief Synopsis

One important study of teachers[1], which focused on Latin America, carried out an extensive review of the academic literature and the different approaches that are prominent in teacher development for school improvement. The review suggested that four broad strategies for teacher education, particularly in developing-world contexts, were likely to lead to success. These are:

- scripted approaches: training to prepare teachers in low-capacity environments to use specific teaching strategies and accompanying materials in the delivery of a well-defined daily curriculum

- content mastery: training focussed on filling gaps or deepening teachers' expertise in the subjects they teach

- classroom management: training focussed on improving teachers' classroom effectiveness through lesson planning, efficient use of class time, strategies for keeping students engaged, and more effective teaching techniques

- peer collaboration: school-based or cross-school structured opportunities for small groups of teachers to observe and learn from each other's practice and collaborate on curriculum development, student assessment strategies, research, and other activities that contribute to system quality as well as teachers' professional development

[115 words quoted.] (Bruns & Luque, 2015, p. 200)

A school-based approach builds on each of these factors and this *Blueprint and Toolkit* takes account of these findings.

It is widely acknowledged that millions of extra teachers are needed to keep pace with demographic change and respond to the large levels of teacher turnover. Successive Education for All (EFA) *Global Monitoring Reports* have recorded this in some detail. UNESCO's Institute for Statistics, which produces the data for these reports, has, despite data-gathering difficulties, demonstrated how the gap between the training of qualified teachers and recruitment needs is widening, particularly at pre-primary and secondary levels.[2] The problem is especially acute in Sub-Saharan Africa.

Data on school performance shows worrying trends. In Sub-Saharan Africa, a study covering 40 per cent of the child population showed that after three years of public schooling, almost half of all students could not read a simple word. Seventy per cent could not read all the words in

a basic sentence and only one child in seven could read a simple paragraph and infer meaning from it. One in five children could not recognise numbers and half of all children could not order numbers. Nearly half of all children could not manage double-digit addition.[3] Similar problems have been identified in large parts of Southeast Asia.[4] This is not a new problem. On 9 March 2010, The *Tanzania Guardian* carried an article by Sinde Ndwasinde under the headline "High Illiteracy Rates a Threat to Development":

> It is totally unacceptable for a child to go through primary school and at the end of it not be able to write his or her name. It means there is something wrong. Whatever it is, we definitely need to improve the methods employed in the classroom.
>
> [47 words quoted.]

As a consequence, there has been increasing pressure to rethink the balance and structures of teacher education. The EFA *Global Monitoring Reports* have repeatedly expressed the opinion that "business as usual" in teacher education is not an option. Academic commentators have observed that the institutions created to educate teachers in the 20th century are wholly inadequate to meet the needs of the 21st century. In country after country, the shortfall between capacity and need is often extreme. In India, for example, in high-population states where poverty is most prevalent, such as Bihar and Odessa, the shortfall between training capacity and need is considerable.

A number of studies have shown that teacher qualification levels do not necessarily correlate with the achievement levels of children and young people. One study in Pakistan used detailed and complex numerical methods to study this and found no differences between the results obtained by qualified and unqualified teachers.[5]

The traditional structure of teacher education places most of the resources at the initial pre-teaching phase, often with expensive residential accommodation. In-service training, which has primarily taken place away from the school, receives a much smaller budget. Analysis of the effectiveness of out-of-school, in-service training shows that it has limited, if any, impact. This is true in both richer and poorer countries.[6][7] Certainly, in a number of contexts, it does not demonstrate value for money. Some large regions in Southeast Asia spend more on transporting teachers to out-of-school, in-service events than on the training itself.

This analysis is not aimed at how initial and in-service teacher education and training is structured. It does, however, point very strongly to the importance of giving much more attention to school-based modes of provision. Providing schools with well-scripted resources to work through new pedagogic strategies, using support staff to provide support to this process (using wherever possible collaborative networks of schools) and fully exploiting the possibilities of online support systems offer significant opportunities to rethink and reform teacher professional development.[8][9][10][11]

There is a momentum behind thinking more carefully about school-based approaches. The UK's Department for International Development (DFID), in developing a new policy for education in 2018[12], included the following proposals for future work:

We will support uptake of the following evidence-based approaches for quality teacher training, recognising that they will be implemented differently across contexts:

- **Practical experience in the classroom and ongoing school-based support,** instead of one-off theoretical training.

- **Assessment of teacher knowledge and performance rather than reliance on credentials,** backed by intensive remedial interventions where teachers fall short of minimum standards. We will support decision-makers to explore the potential of education technology to enable delivery of remedial education at scale, as part of a blended learning approach which also includes face-to-face support.

- **Teaching strategies proven to work well for poor and marginalised children,** such as teaching at the right level for each student through an interactive approach, regular assessment and where practical teaching in small groups, rather than focusing on the best performers or sticking rigidly to curricula that are too advanced for many students. We will also support education systems to ensure that a growing number of teachers have the skills and resources to support poor and marginalised children, including hard-to-reach girls, children with disabilities and children affected by crises. This includes developing the teaching workforce so that it reflects the diverse cultural and linguistic groups present in a country, enabling children to be taught in a familiar language, and ensuring those teachers are willing and able to challenge discriminatory social and gender norms.

- **High quality teaching materials,** including open digital resources customised for different contexts, accessible via mobile phone.

  [245 words quoted.] (DFID, 2018, pp. 16–17)

These aims and ideas are now widely shared across the education and development community. Most experts argue that the school must become the focus of teacher development. They point to both the empirical evidence that professional learning in the school actually impacts on practice and the logistical impossibility of education systems making professional development provision in the old "out of school" mode. This *Blueprint and Toolkit* for introducing well-structured school-based approaches represents a contribution to this growing reform movement.

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[10] Power, T. (2012). English in Action: School-based teacher development in Bangladesh. *The Curriculum Journal, 23*(4), 503–529.

[11] Hassler, B., Hennessy, S., & Hofmann, R. (2018). Sustaining and scaling up pedagogic innovation in Sub-Saharan Africa: Grounded insights for teacher professional development. *Journal of Learning for Development, 5*(1), 58–78.

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SECTION 3
External Support for SBTD

A major World Bank study of in-service teacher professional development examined all the research on this theme over the last decade (see reference [7] on the previous page). The study looked at the most rigorous quantitative and qualitative research and concluded that there is evidence that in-service teacher-training programmes have been most effective at improving student learning when they:

- are embedded in the curriculum;

- are prescribed in some detail with detailed instructions on implementation;

- include significant and sustained in-person follow-up support for teachers; and

- involve teachers in a co-learning mode of working.

The design and development of this *Blueprint and Toolkit* have taken these findings into account. The focus is on SBTD activities. It is important to remember that all the activities have been successfully carried out by thousands of teachers across many different continents and countries. Where this has been most successful, there has been school-based engagement with external experts (such as advisors, inspectors and senior teachers from other schools in the community).

How often an external expert can visit the school depends on local context, geography and resources. The Toolkit is designed to be implemented over a 12–15-week period (through, for example, one term or semester). If resources allow, then school support on three occasions appears to work well. This would involve a preliminary visit to ensure that the teachers and school as a whole are ready for the education and training event, a mid-term visit to check how things are going (including convening meetings with the principal and staff as a whole or departments) and a concluding visit to bring everything together and plan next steps. There may also be opportunities to convene meetings that bring teachers from different local schools together to discuss the issues addressed by the activities. There are now major opportunities to use varied modes of online working to support teachers. These are fully explored in reference [9] on the previous page.

Supporting School-Based Working

In supporting the sort of school-based working set out in the Toolkit, a number of points need considering. Ten of the most important are briefly set out below:

1. **Justification:** It is important that teachers see the justification for this approach. This Blueprint provides a rationale for the approach, including the importance of professional occupations to improve practice and keep up to date (see medicine, law, architecture, for example).

2. **Sensitivity to context:** Where a strong core of senior staff exists, external input might be minimal. Where a school, or group of schools, lacks experienced leadership, a stronger presence may be necessary.

3. **Providing professional value:** A visit by an external expert to a school is a resource-rich activity. As such, it needs planning and preparation. The activities in the Toolkit are designed to be implemented without external support. So what is the "value added" aspect of a visit? The answer might include administrative purposes, but at its most valuable such a visit provides pedagogic stimulus that goes beyond that contained in the Toolkit.

4. **Exploiting technologies:** Online and web support for teachers is now possible in many countries and regions. The activities in the Toolkit derive from online communities of practice. Teachers who have connectivity should be encouraged to explore online resources that go beyond those in the Toolkit. External experts can also keep in touch electronically. Supporting principals who are implementing the Toolkit could also have an important electronic dimension.

5. **Judging quality and using data:** Perhaps one of the most important functions of external support is providing benchmarks for quality. External experts could advise on how data should be used to judge improvements in outcomes. External experts have the experience of working across a variety of schools and so can give guidance on the quality of the school-based activities being implemented.

6. **Giving recognition:** Support from outside can have an important role in giving recognition for the efforts teachers make in school-based developments. This can range from positive conversations with individuals to school- or district-wide presentation of Certificates of Completion. Planning for how to recognise teachers' efforts is an important part of the development process.

7. **Valuing school-to-school collaboration:** The external expert working with a school or departmental staff represents a small network. There is no overall Blueprint that can be provided for experts, but setting up multi-school linkages that exploit electronic (as well as occasional face-to-face) meetings will offer stimulating opportunities for teachers.

8. **Identifying pedagogic leaders:** The external expert has an important role in identifying good practice and teacher leaders in the local community. Using such teachers to make presentations, feature in online communications or present ideas at awards events is a powerful, local form of support.

9. **Remembering induction processes:** The Toolkit presupposes a whole school staff going through the SBTD process in the first instance. In subsequent terms and years, new staff will arrive; using the Toolkit in induction processes will reaffirm shared pedagogic practices and professional values.

10. **Looking to the future:** The external expert can have a significant role in identifying future targets for individual teachers and for a school as a whole. The programme set out in the Toolkit is an introduction to school-based development. The activities are a small sample and will need building on further to improve practice.

Building Professional Discourse through SBTD

A range of support strategies exist that promote professional discourse. Research shows that the most significant influence on a teacher's practice is dialogue with nearby colleagues. The Toolkit aims to improve the quality of that dialogue through a varied menu of school-based activities.

Where an external expert or school leader takes proactive action to work with teachers in establishing a school-based approach to raising achievement, support structures need explicit planning. For example, a number of overlapping methods have been created within the teacher development community; these include ideas about quality circles and communities of practice. There is a plentiful literature on both, and anyone providing support to schools is likely to be familiar with these concepts or wish to find out more. Some brief notes to serve as an initial orientation are provided below.

QUALITY CIRCLES

A quality circle is a small group of between three and 12 teachers who do the same or similar work, voluntarily meeting together regularly, usually under the leadership of a more experienced teacher or external expert, and trained to identify and analyse challenges posed by their work. The aim is to "own the challenge" and therefore come up collectively with communal ideas about change and improvement.

There are two main tasks assigned to quality circles: the identification of problems and the suggestion of solutions. Secondary aims are to boost the morale of the group through attendance at the meetings and to provide a formal opportunity to discuss work-related issues.

Meetings are held in an organised way, with an appointed chair, a prepared agenda and someone to take minutes. The minutes are a useful means to follow up proposals and their implementation.

The success of quality circles depends crucially on the amount of support they get from senior staff in a school (principals are important in making the strategy work effectively) and on the amount of training that the participants are given in the ways and aims of the circles.

The evidence demonstrates that teachers need time and practice to understand the quality circle concept. In one sense, the quality circle model, which had its origins in Japanese modes of management, is only a slightly more formal way of organising teacher discussion. However, the added formality may be the secret of the success of this idea. More recently, it has been suggested that quality circles only really work when the respect for ideas is part of school life in general.

COMMUNITIES OF PRACTICE

The idea of "communities of practice" has existed for a long time. Bridge engineers, cancer specialists or apprentice carpenters represent such communities. The "community" relates to a field of expertise, and contemporary ideas focus on a formalisation of interaction to improve practice. However, the idea as a concept of value to teachers is relatively new, although teaching is an activity that clearly represents a community of practice. This *Blueprint and Toolkit* presupposes that teachers can deliberately work together to develop and improve their practice.

A community of practice in this sense explicitly plans for dialogue and engagement. The community might mean the staff of a primary school or a subject department within a secondary school. Three dimensions of communities of practice need to be understood:

1. the focus of the activity around which the community engages (e.g. Science teaching);

2. the functioning of the community (i.e. members engage in joint activity, help each other and share ideas); and

3. the teaching practice itself.

Members of a community of practice develop a shared repertoire of resources, experiences, stories, tools, and ways of handling recurrent problems. This takes time and sustained interaction, not just a chat outside a classroom.

BUILDING PROFESSIONAL COMMUNITIES

Quality circles and communities of practice seek the same ends: to improve practice through shared engagement. It is difficult to conceive of SBTD without thinking of ideas about quality and professional communities. The Toolkit resources seek to promote dialogue and discourse. External support to the school needs to build and promote these types of approaches. Analogies are always useful. You would not expect nurses on a cancer ward or medical experts on heart disease to work in isolation, rarely discussing immediate problems or how to improve treatments and practice. Teachers carry the responsibility to provide education for the whole community and the way they set about this requires similar processes of engagement.

External help can serve purposes that go beyond the basics of school-based approaches to professional development. For example, it can identify particular problems in a specific school or group of schools (such as ways of helping disadvantaged children and young people), provide guidance on the wider online availability of resources, and help create and sustain local communities of teachers through social media as well as inter-school face-to-face meetings. However, all of this should always be focused on the practices of teachers in schools and classrooms and the achievements of the children and young people they serve.

SECTION 4
The Teacher Toolkit: Secondary

Introduction

This Toolkit is for classroom teachers in secondary schools. Teachers, like all other professionals (doctors, nurses, lawyers, architects and many others), can develop their skills and expertise throughout their careers. This is essential in our fast-changing world. No one would like to be treated by doctors who relied only on what they learned during their initial training! The same is true of all professionals. Parents/carers and local communities value teachers who show a commitment to improving their practice on a regular basis.

There is now good evidence that the most effective forms of professional development for teachers take place in school. Teachers value the help they can receive from their immediate colleagues.

School-based teacher development (SBTD) also benefits where possible from the help of external agencies. A visiting advisory teacher might provide this or it could be through an online programme.

In many parts of the world, local advisory teachers and in-service training staff can also play a valuable role. There should be someone in the school coordinating the implementation of SBTD. This might be the principal or a senior experienced teacher. SBTD is about improving the practice of individual teachers, but it is also about teamwork and improving the school's achievements as a whole.

Good resources to assist with trying out new approaches are also important. We hope you will see this Toolkit as one such resource.

Using the Toolkit

The Toolkit is organised around **ten key questions**. In responding to each question, you will find general **commentary** on the issues involved and **activities** that you can try out with your classes. There are also some descriptions of **other teacher's experiences t**o provide further guidance for you. The accompanying *Key Resources* should be used alongside the *Blueprint and Toolkit* when working through each question. The most relevant *Key Resources* in each case are listed at the beginning of each question.

It works best when all teachers in a school participate together to discuss the issues involved and to share practice. It is also a good idea to keep a record of the activities you carry out and your reflections on how well they went.

It is suggested that you work through the programme set out in the Toolkit in about 12–15 weeks, which may mean around 5–7 hours a week in school. But remember that most of the

activities in the Toolkit involve classroom applications, so you are both teaching and developing professionally at the same time.

The Toolkit has been based on experience from many parts of the world. All the activities have been tried out by thousands of teachers. The Toolkit provides a starting point for introducing SBTD. From this, you can establish further programmes and activities that make ongoing improvement a feature of the life of your school.

?

The ten key questions for secondary teachers are:

1. Why do teachers need to engage in professional development?

2. What makes a good teacher?

3. How can we make learning more active?

4. Why are the questions teachers ask so important?

5. Why are explaining skills so important to successful teaching?

6. How can teachers improve their school and subject knowledge?

7. How can the teaching of your subject be improved?

8. How can teachers use the local environment?

9. How can teachers involve parents/carers in their children's learning?

10. How can teachers continue to develop professionally?

You will see that the first three questions are general and require discussion activities. Questions 4–10 all involve discussion with colleagues and activities you can carry out in the classroom.

Question 1: Why Do Teachers Need to Engage in Professional Development?

> ### Activity 1: Discussing improving practice
>
> Here we want all the teachers in the school to come together to discuss why improving practice is so important. You might like to divide into smaller groups — for example into subject departments — so that everyone has the opportunity to speak. Each group could record their ideas (on a chart or on large pieces of paper) and then share with everybody else.
>
> At the close of the discussion, make a note of the key points agreed. Then read the commentary below and revise your key points as you think appropriate.

COMMENTARY

We have already mentioned that teachers, like other professionals, are expected to keep up to date with new ideas. For many of you, the content you are teaching will change over time. This is especially true, for example, of topics in Science. But other subjects are also subject to change. The teaching of History in secondary schools may develop as a consequence of syllabus reform. New discoveries by historians or archaeologists might change the way some historical topics are taught.

New ideas about teaching methods are also bound to appear during your teaching career. In recent years, developments in technology have had a major impact on all aspects of our lives. Many schools are using new forms of communication technologies in the curriculum. Even where technological resources are limited, teachers need to be preparing to use them when they become available.

However, teaching methods are about more than just technologies. In recent years, we have become more aware that certain teaching approaches lead to more successful learning. We increasingly see the need for students to learn actively, for example in verbalising their learning. The Toolkit gives attention to how pair work in the classroom can promote this. It also emphasises the way more traditional teaching strategies can be made more effective, such as the careful use of questioning and explaining.

It is also important to recognise that the expectations of teachers change. There is increasing attention, in all parts of the world, on improving the achievements of students and the school as a whole. This involves teachers thinking more explicitly about how well their students are doing, and the sort of data they might need to collect to help in this process. Many students come to school with disadvantages that education needs to help overcome. Our understanding of how we help students like these evolves and changes over time. Teachers need the skills to monitor and support such students.

There are not many, if any, opportunities for teachers to go away from school to further their professional development. The school, therefore, including all your colleagues, becomes the most important place to improve your teaching.

Question 2: What Makes a Good Teacher?

See Key Resources 1, 2, 6 and 15, although all the Key Resources are relevant.

Activity 2: Discussing what makes a good teacher

This is another activity to carry out with all the teachers in your school. If you used groups in **Activity 1**, you could use the same groups again to discuss the question: "What makes a good teacher?"

There are many ways that this question can be answered. Read this account from a Kenyan school principal who has often used this discussion question in her school:

"Can you remember a really good teacher? Can you remember why you thought the teacher was so good?"

I often begin a teacher professional development session with these two questions. There is always quite a heated debate! I remember recently, in Nairobi, the questions sparked some controversy.

One teacher said: "My best teacher really took an interest in us; she knew something about every student in the class and she was good fun."

Another teacher said: "The teacher I remember best taught us Science when I first went to secondary school. She really knew her subject, especially Physics. And I looked forward to every lesson. When I look at a map of the universe today, I often think back to her lessons."

Why did such sensible comments create controversy? It was because some members of the group thought personal, relationship qualities were paramount, and others said they liked teachers who "really knew their subject or subjects." Eventually a compromise emerged. Good teachers could be good in different ways! A shy teacher, who taught well and conscientiously, could gain respect just as much as an extrovert who was jokey and fun.

During the session, however, the group began to understand that while the good teachers they remembered had different characteristics, they also had things in common. "We never wasted time in class," was an observation that had everyone's agreement. "They were good at explaining things," was a quality we agreed characterised all the best teachers.

Most importantly, everyone thought they would like to be remembered as a good teacher.

Following your discussion, work together to make a chart to go on the wall of the teacher room. This might look something like the following:

GOOD TEACHERS IN .... (the name of your school)

1 are up to date in the content knowledge they are required to teach

2 ....

3..

Perhaps the most important point of the previous activity is for you to relate your own practice to good teachers who taught you. Do you recognise in yourself the characteristics of the good teachers you knew? Think as well about your own children or the children of a relative. How would you expect them to be taught? Do their teachers practise the sorts of skills and values you recognise in describing a good teacher?

Remember, good teachers demonstrate values that go beyond technical classroom competence. Good teachers have an excellent attendance record because they are loyal to their students. Good teachers value every student, regardless of gender, ethnicity or socioeconomic circumstances. Good teachers are aware when individual students have difficulties at home and find time to talk privately with them.

Importantly, good teachers show a commitment to really helping children and young people with social disadvantages. The extent and nature of disadvantage varies from one context and school to another. In schools that serve economically poor communities, most — if not all — of the children are disadvantaged. Schools in conflict or refugee situations would also have high, even 100 per cent, levels of disadvantage.

Teacher expectations

It is important for teachers to understand that "teacher expectations" are crucial in redressing disadvantage. If the expectation is that a child coming from a poor home cannot learn, then that becomes a self-fulfilling prophecy. We also know that in some countries children from different ethnic groups can be perceived differently in terms of learning potential. For a variety of reasons, girls can experience social and educational disadvantage. Good teachers evolve strategies to address these problems.

Teachers must challenge such social stereotyping and the best way to do that is to hold the highest expectations for all children and young people. As teachers' we ought to feel that it is at the core of our professionalism to help disadvantaged children to make a success of their schooling. There are many famous people who would not have achieved anything without the help of an influential teacher. Nelson Mandela often spoke about the importance of education. One day, when thinking about disadvantaged children, he said: "A good head and a good heart are always a formidable combination. But when you add to that a literate tongue or pen, then you have something very special." A good teacher provides the literate tongue and pen, and much more besides. High teacher expectations are always present when children are successful in their learning.

Saif's story

When Saif was 12 years old, his father had changed jobs and he had to move to a new school. He did not know anyone. In the first week, he sat next to a boy who was not very well behaved in class.

At break, he stayed with the boy and some of his friends from another class. The other boys began playing a game of throwing stones to try and hit each other's feet. One of the stones hit a teacher. The whole group was taken to the school principal and punished, including Saif who had not thrown any stones.

To his horror, Saif then discovered that the teacher who had been hit was his Mathematics teacher. In his first Mathematics lesson, the teacher said, "I do not want you two troublemakers sitting together," and Saif had to move to the front of the class. In the weeks that followed, the teacher was very critical of Saif's work and his behaviour, even though Saif had done nothing wrong. This made Saif feel very unsure of himself in Mathematics.

However, after two months, the teacher began to realise that Saif was quite good at Mathematics and always well behaved. And by then Saif had also found new friends!

Have you ever had a similar sort of experience? We tell this story because it illustrates just how powerful expectations can be, even when the expectations are unfounded. Making judgements about someone's potential based on just one experience can have limiting or exaggerated outcomes.

Many factors influence our expectations of situations, people and events. Our previous experiences are a key factor, as are our beliefs and values. We make decisions and judgements about what we should do, where we should go and whom we consider to be our friends, from what we know already about people, situations and events. This is true of both our personal and our professional lives. Working as a teacher, your day-to-day decisions will be influenced by a range of factors. Think about what these might be.

For example, research tells us that, all over the world, the following factors seem to influence teachers' thinking:

- A child's socioeconomic background
- A child's appearance (e.g. stereotypes exist about tall or short students)
- The teacher's experience with a child's siblings
- Gender (e.g. in some contexts boys are seen as more able in Mathematics than girls)

Can you think of other factors that might influence how you respond to the students in your class and the effect these may have had on your teaching?

Do expectations hold true?

The two following accounts explore what research revealed about children in two different communities when they went to school.

The street children of Brazil

A few years ago, educational researchers became interested in the "street children" of Brazil. These were children who lived in slum areas or had no home at all. The researchers discovered that these children made very poor progress in school and performed particularly badly in Mathematics. The children would sit solemnly at the back of the class and rarely participate. In the opinion of the teachers, the children's poor background was responsible and they did not see how they could help them.

The research team then went to visit these children in their homes or on the streets where they lived. All were involved in buying and selling of some kind. Many of them were able to mentally calculate currency exchanges for a variety of South American currencies. The researchers found these children engaging very successfully in complex mental arithmetic, way beyond the level expected in the school curriculum.

When the team talked this through with the children, they discovered that they were using highly effective problem-solving techniques, but of a very unusual kind. Such techniques were not part of the school Mathematics syllabus at all! But there is always more than one way to solve a problem, and this could have been a starting point for the teacher to involve the children in the class by acknowledging their unique way of solving the problems set. This could help all the children think of different ways to solve the same problem. In this way, the "street children" would feel much more part of the school and gradually be encouraged to participate more fully and actually have their potential realised.

In the school context, therefore, expectations of Mathematics achievement for these children were low, and that was borne out by subsequent school level attainment. Yet, in another context, these children were superb mathematicians!

Korean children

Educational researchers have also looked at Korean children who migrated to other parts of the world in the latter part of the 20th century. They followed up groups of such children and observed how they performed in school.

The findings are very interesting. Children who migrated to Japan — where attitudes to and expectations of Korean children were very poor — did badly at school. Children who migrated to the west coast of the USA — where expectations of Asian children were very high — did very well in school. So, children from the same sorts of homes performed very unequally in two different settings. The researchers felt that teacher expectations were the key variable here.
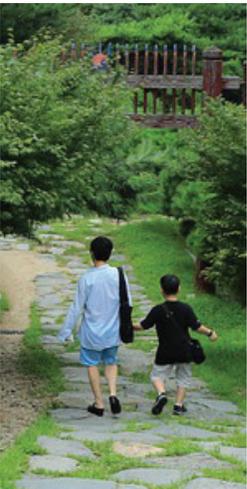
Question 3: How Can We Make Learning More Active?

All the Key Resources are relevant to this question, but see particularly 3, 4, 7 and 11.

COMMENTARY

There is now nearly universal acceptance that learning must be an active rather than a passive process. We all learn best when we have to articulate ideas or work with other people on tasks. No SBTD programme should be carried out in silence!

There have been significant pedagogic changes in all areas of the curriculum in terms of active approaches to learning. For example, in language teaching, there is now a much greater focus on developing "communicative" skills that involve far more interaction between you and the students, and between the students themselves. The contemporary teaching of Mathematics and Science gives increased emphasis to investigations and problem solving in order to develop students' understanding and ways of thinking and acting scientifically. Similarly, topics such as climate change and globalisation have gained more importance across the curriculum and require the development of new pedagogic strategies.

Using different ways of working in the classroom will support these changes and will help students gain a deeper understanding of the subjects, topics and related issues. To reflect this, we have seen a change of emphasis towards children and young people being more actively engaged — both physically and mentally — in their learning. This has been driven by developments in our understanding of the way the brain functions in the learning process. The old idea about each of us having a fixed intelligence has been discarded. It is now thought that we are not born with one predetermined intelligence, but given the right conditions — and school is an important condition — we are all capable of learning a great deal more than was previously thought possible.

The importance of this "active" learning, which includes students carrying out investigations, problem solving, and asking and answering their own questions, has come increasingly to the fore in recent years. Children and young people become more effective learners when they talk about ideas and engage co-operatively with others to carry out tasks. However, if there are a large number of students in a small classroom, some people may think that more passive approaches, such as students sitting quietly in rows listening to the teacher, appear to have advantages. Some students will, in fact, progress under this approach, but many others will not. The evidence suggests that it is possible, even with large classes, to develop more active approaches to learning. As a result, children's achievements in school improve, but these approaches also provide a good foundation for learning later in life. Most jobs in the future will require people to be flexible, capable of learning "on the job" and able to apply new knowledge quickly and effectively. Just think about the changes in communication technologies over the last two decades and how you have had to respond. This sort of adaptability will be needed in most jobs, and schools have an important responsibility to ensure all children and young people will have the necessary capabilities. Although these are not necessarily new ideas, they have not always been fully recognised in many schools and education systems.

By carrying out the following activity, we want you to develop awareness of the links between active pedagogic strategies and improved student learning.

Activity 3: Assessing your active learning approaches

Think about your usual classroom practice (i.e. what you usually do when you are teaching).

In the chart below are 15 statements about actions and approaches. We want you to tick (✓) one of the five boxes for each statement. The boxes range from "Very often" on the left-hand side to "Very rarely" on the right. So, for example, if you decide, having read statement 4, that you very frequently ask the students to work in groups, then tick the box on the left ("Very often").

As you work through the statements, think about why and when you use the approaches listed. Also, think if there are any approaches that you do not use often. If so, why do you think this is?

Teacher self-assessment for active learning: Checklist

ACTION/APPROACH	VERY OFTEN	OFTEN	SOMETIMES	RARELY	VERY RARELY
	1	2	3	4	5
1. Students are highly involved in class activities and tests.					
2. Students share their ideas with each other and me.					
3. Students can relate new concepts to their own lives.					
4. Students work in small or larger groups when solving problems.					
5. Students use a range of resources to help them try out their ideas (e.g. making models).					
6. Students prepare with a partner or team before sharing ideas with the class.					
7. Students debate issues and viewpoints.					
8. Students use a variety of library and other resources to develop ideas.					
9. Students bring into class information that extends across subject areas or links topics.					
10. Students suggest possible problems that can be addressed.					
11. I help students to explore, extend and connect their ideas.					
12. I give support for solving problems, but do not give away the answers.					
13. I relate new information or problems to what students have already learned.					

ACTION/APPROACH	VERY OFTEN	OFTEN	SOMETIMES	RARELY	VERY RARELY
	1	2	3	4	5
14. I ask questions that encourage students to think.					
15. I provide diagrams or pictures to make information clearer.					

Look at **your** answers and notice whether they are mostly at either the "Very often" or the "Very rarely" side of the table, and think about the kind of classroom you have. Would you say the results indicate that you have a moderately active classroom or a more passive classroom?

COMMENTARY

The checklist in **Activity 3** was designed to open up your thinking about your classroom practice. There is no precise response that is right or wrong. If you replied "Very often" to all 15 statements, you might be seen as a "super teacher"! You would not expect any teacher to be doing all those things very frequently. However, if all your responses were "Very rarely," then perhaps your teaching style is too passive and you are not providing enough opportunities for the students to engage actively in learning.

Now read about the experience of another teacher who was trying to use more interactive teaching strategies.

ANOTHER TEACHER'S EXPERIENCE

Jean teaches Grade 7. She is keen to use more interactive teaching in her Science lessons and planned the following lesson to involve all the students at a level that they could understand.

Jean planned that the students, as part of the Science curriculum, would learn about the classification and adaptation of domestic and wild animals. The day before the lesson, she asked them to bring some pictures of animals that live in their area for their Science class. She also looked for some pictures herself, as she knew that not all the students would be able to bring in a picture.

In the lesson, Jean asked some of the class to tell her what they knew about these animals and then she asked others what they would like to know about the animals. Many of them wanted to know about their life cycle, their habits, how to look after them and what they eat.

Jean divided the class into pairs each and asked them to classify each of the animals into one of two groups:

• Animals we keep and use in different ways (e.g. for meat, milk and travel)

• Animals we do not keep or use

Jean then introduced the concept of adaption and gave examples of how different species adapt to the environment in which they develop. She told the story of Charles Darwin's voyage in the *Beagle* to the Galapagos Islands and the discoveries he made there:

"Charles Darwin was an English naturalist who lived during the 19th century. In 1831 he set off on a five-year trip on a ship called the HMS Beagle to collect specimens of plants and animals from around the world. As part of this trip, he visited the Galapagos Islands, a group of islands in the Pacific that are home to animals and plants not found anywhere else. One of the things Darwin noticed was that the different islands were home to different kinds of tortoise. He also realised that the finches (songbirds) on the different islands were basically the same, but there were big differences in features such as their size, beaks and claws. Darwin concluded that over time species changed or adapted to local food sources and their surroundings. Eventually Darwin's studies led to him publishing his theory of evolution in a book called On the Origin of Species in 1859."

She asked the pairs to discuss this. Then she asked each pair to work with another pair for ten minutes to produce examples of three animals that demonstrated different forms of adaption. Each group of four then presented one of their animals to the class, explaining what form the adaption took (Jean used the example of polar bears to describe what they had to do). No group could present an animal already identified and Jean drew up a list on a flipchart. She then used this for a rapid question-and-answer session to complete the lesson.

COMMENTARY

To work like Jean, you have to do some prior planning, including the preparation of resources. But during the lesson you have to be alert to the contributions the students make. Some of the most successful and creative teaching comes from the dialogue and exchanges that careful planning has set up. Jean used this starter activity for an extended study of classification and adaption in the Biological Sciences.

Question 4: Why Are the Questions Teachers Ask So Important?

See Key Resource 5.

COMMENTARY

Many experts argue that the most important skill that all teachers need is the capacity to ask good questions. In Ancient Greece, asking questions was the way the philosopher Socrates taught so successfully. His methodology was built around asking increasingly probing questions that eventually built frameworks of knowledge in his students' understanding of philosophy.

Your classroom is a long way from the conditions of Ancient Greece! However, the questioning approach to teaching remains very important. Questioning is a valuable tool in helping children and young people learn and make sense of their world. Questioning encourages deeper thinking and creativity. The more teachers ask questions, the more they become aware of individual, group and class learning, understanding and progress.

Few — if any — of us learn in a totally linear way. Sometimes it is easy for us to miss important links and sometimes we find it difficult to make sense of what is being said or done. The teacher needs to be aware of the difficulties students may have and to plan more precisely to help them and "scaffold" their learning. Questions are at the heart of this process. However, research shows that questioning in many classrooms today can be very restricted.

There is a range of different types of questions that you as a teacher can use to help the students in your classes think more actively and creatively. For example, the rapid questions and answers of a teacher-led "brainstorming" session can be used to arouse interest, provide information about what the students already know or gather information about what a group has learned.

The activities linked to **Question 4** ask you to look at some of the ways to classify questions and how they can impact on teaching and learning in the classroom. The first activity asks you to reflect quickly on reasons to use questioning to start you thinking about its crucial place in the teaching and learning cycle.

> **Activity 4: Thinking about the purposes of different types of question**
>
> Look at the list below, which describes ten reasons for asking questions. Which do you think are **most directly focused on learning**?
>
> 1. To arouse interest and curiosity about a topic.
>
> 2. To focus attention on a particular issue or concept.
>
> 3. To develop an active approach to learning.
>
> 4. To stimulate students to ask questions of themselves and others.
>
> 5. To structure a task in such a way that learning will be maximised.
>
> 6. To identify specific difficulties that prevent students from learning.

7. To communicate to the class that they are expected to be involved in the lesson.

8. To provide an opportunity for students to assimilate and reflect upon information.

9. To help the development of thinking skills.

10. To express a genuine interest in the ideas and feelings of students.

It should be clear that numbers 2, 5, 6 and 8 are clearly related to learning progress and the other points are all related to helping students learn and to understand better how they learn. But all the ways of questioning in this list have a place in the teacher's repertoire of questioning skills. The important thing is to be aware of which types of question you need to use frequently in order to check progress, and which types of question help learning.

ANOTHER TEACHER'S EXPERIENCE

Naji was beginning a new topic on plants and he decided to use the students' own questions as a starting point for teaching the topic. He understood that good questioning was essential, but he liked the idea of the students raising the questions themselves. So, at the beginning of the first lesson, he put some pictures of plants on the class wall. He told the class they were going to learn about plants, how they grow and how important they are. He said he wanted the students to work in pairs and brainstorm as many questions as they could think of to ask about plants. Then he had a whole-class session where each pair contributed a question. He wrote many of the questions on the board, sometimes helping the students to refine their questions as he did it. Here is their list:

- Why are plants usually green?
- Why are some plants poisonous?
- Why do some plants grow in the desert, but not others?
- Do plants grow on the Moon?
- Why do plants need water?
- Why do we call some plants weeds?
- How many plants are there in the world?
- Is seaweed a plant?
- Do all plants need water?
- What makes some plants better to eat than others?
- What is the difference between a plant and a herb?
- Is it true that oil comes from plants?
- Can you eat flowers?

Naji discussed with the students how they could create *categories* of questions. He asked them to think of some categories and, working as a class, this is what they came up with on the board.

The structure of plants	How plants grow	The differences between plants and other forms of life	Different types of plants	What plants are used for`

Naji could now use this categorisation table to help him plan future lessons on plants. He gave each group one of the five categories in the table to investigate and gave them some resources to help them. For example, he gave the group who were to investigate the structure of plants some samples of plants and reference books. These students produced a diagram of the main structure and features of a plant and shared it with the whole class and it was displayed in the classroom during the topic. For the other questions, the students collected plants, tried to grow plants or used reference material.

COMMENTARY

Naji's approach stimulated the students' interest and helped them to think more deeply about the ideas they were investigating. They were all actively engaged from the start of the lesson and Naji was also able to gain insight into their prior knowledge. He then planned his lessons to build on their prior knowledge through the use of focused questions. Naji provided resources to help them find answers to their questions and put them in groups so that they were able to share ideas and discuss problems together. This approach helped the students to take much more responsibility for their own learning and construct their understanding together.

Questioning students also enables them to hear explanations given by their classmates; this process helps build understanding as the student compares other students' explanations to their own ideas.

Now try **Activity 5**, which asks you to try a similar approach.

Activity 5: Using questions as a teaching methodology

Try this activity out with one of your classes.

Find four or five objects that are relevant to the topic you are teaching and that could be put around the classroom, such as pictures, maps or artefacts (e.g. if you were teaching a topic on light, you might bring in a torch).

Ask the students to work in pairs. If there is enough room in the classroom, you might ask them to leave their seats and come and look at the objects. If there is not much space, you could do this in sequence, with only six or seven pairs looking at a time.

When the students return to their seats, ask them to write a question for each object. Proceed by writing some of the students' questions on the board and working with them to refine the questions and classify them.

In a whole-class discussion, get the students to answer the questions that can be answered straight away. Then discuss with them how they could answer the other questions. List their ideas, and then tell them they will try to answer some of these questions in the next lesson. Ask them to bring in any books they may have that might help them answer some of the questions.

After the lesson, write down how it went. Concentrate on how the students were involved, the kinds of questions they raised, and the learning the activity produced. Think also how you could do this activity again and make it more effective. Plan how you will answer some of the other questions with your class in the next lesson.

COMMENTARY

Asking questions is a stimulating and interesting way to engage students in new topics and assist their learning. Some recent research asked teachers who were new to teaching why questions were important. The main reason given was "to find out about students' knowledge and understanding." But research in many classrooms shows that teachers can easily forget this!

One study analysed more than 1,000 questions heard in a series of Year 1–6 classes in one small town. The researchers first looked at whom the questions were addressed to. They found that 12 per cent were addressed to groups of pupils, 22 per cent to the whole class and 66 per cent to individuals. This could be construed as encouraging, as the teachers were providing an individual focus.

The researchers, however, then looked at the sort of questions being asked. They found that:

57%	35%	8%
were managerial (i.e. to do with equipment or the organisation of the classroom, such as "Have all the pencils been collected?")	were about facts, information or data (e.g. "How many million people live in Cairo?")	were what are termed "higher order" questions, which make students think hard about an issue (e.g. "How could we test out your idea that plants need water to grow?")
MANAGERIAL	INFORMATION	HIGHER ORDER

The researchers in this project found that teachers were asking lots of questions, but only a small number of them could be seen to be supporting a more active engagement by students in their own learning.

The next activity looks at a transcript of a lesson and asks you to do some analysis of the types of questions one teacher asked in a session. This will help you develop your understanding and ability to recognise different kinds of questions.

Activity 6: Analysing types of questions

Read the questions below and then the transcript, which is from a lesson in a primary school. Make a response to the following questions:

- Can you find an example of a managerial question?

- Are there examples of questions that are really commands?

- Which is the first key question about the content of the lesson?

- Why do you think the teacher asked the key question?

- In what direction does the teacher then take the lesson?

- Do you think the teaching and learning sequence was appropriate?

Transcript

Teacher: Right, can you all sit down now? Can I have you all looking this way? Can you remember that last month we did some work on the topic "Spring"? Please put your pens down. Today we are going to extend that topic. I want you to listen to some music. You need to concentrate very hard, so it would be a good idea to close your eyes while the music is playing. I want you to think about the ideas and images that the music brings into your minds. Images, remember, are like pictures in your head. But before we listen to the music, can we predict what some music about Spring would be like? Think hard. Omar, what do you think?

Omar: Bouncy.

T: Right, bouncy music. Can we think of other words?

Omar: Fast.

T: Interesting – bouncy and fast. Why did you put these two words together?

Omar: I was thinking of newborn lambs.

T: Right, lambs bouncing around, springy, yes. When we think of Spring as a season, what comes first into your minds?

Ali: Flowers.

T: Flowers, good.

Ahmad: Sun.

Nabeel: Animals.

T: Animals, what sort of animals?

Nabeel: Sheep, birds in the air.

Sami: New animals.

T: Right, newborn baby animals. Can you think of other words?

Bassam: Joy.

T: Right, now I'm going to play the music. Listen carefully. Remember, it might be a good idea to close your eyes. At the beginning of the music, I want you to think of the beginning of Spring. There is new life. While the music is playing, I want you to think about all the ideas, images, pictures that the music brings into your mind. I'm going to give each pair a large piece of paper. When the music stops, I want you to write down what came into your mind when you heard the music. Can you think about all the images of Spring that this music conjures up? Right, now I'm starting the music. If you want to close your eyes, close them now...

COMMENTARY

Make a note of your responses to the questions in **Activity 6**. Hopefully this exercise has helped you identify the different types of questions that teachers use in the classroom and, as you have analysed this lesson, you may have noticed the number of managerial questions and statements that the teacher has used.

This will help you to carry out the next activity, which asks you to find out about what kinds of questions you use in your classroom. It asks you to reflect on the balance between those that are organisational/managerial and those that encourage thinking. Carry out **Activity 7** with a colleague and share your experiences after watching each other teach.

Activity 7: Thinking about your own and a colleague's questioning

For this activity, you will need a colleague to come and observe part or all of a lesson. Give your colleague a chart like the one below. Make sure your colleague is familiar with the three types of questions and can recognise them easily. Ask them to keep a tally of the type of questions you ask.

MANAGERIAL QUESTIONS	INFORMATION QUESTIONS	HIGHER-ORDER QUESTIONS

At the end of the lesson, discuss with your colleague the proportion of questions that fell under each category. Are you happy about the distribution? Did you have sufficient higher-order questions? If you think the balance needs to be changed, what do you think you can do to improve it? What was your colleague's impression?

Next, do the same activity, but change roles so that you observe your colleague's lesson. Again, share your thoughts about what happened and discuss how you each use questioning in your classroom teaching.

Closed and open questions

Another common way to distinguish between the types of questions teachers use in the classroom is in terms of *closed questions* and *open questions*.

Closed questions have a fixed limit. They are often answered with a "yes/no" or with a simple statement of fact. Closed questions are used to direct the conversation. They get specific information or confirm facts, and generally have only one answer. An example of a closed question would be: "Do you have a pencil?"

Open questions encourage a variety of responses. An example would be: "Look at this photograph of oil tankers. Why do you think some are smaller than others in the picture?" This prompts students to think more deeply about the concept or issue raised in the question and to suggest answers. Well chosen, open-ended questions are similar to higher-order questions, as they encourage thinking.

Another example would be: "Look at these two pictures of workers cultivating fields. One was taken in southern India, the other in Australia. What are the main differences between the pictures?" This gives students the opportunity to explore many different ideas and themes around the two pictures and also gives the teacher insight into the kinds of connections the students have made between the pictures. This will help the teacher to move the lesson on to the next stage more precisely.

Researchers agree that open questions are likely to create a stronger learning situation than closed questions, as they allow children and young people to explore their ideas more and listen to alternative views and ideas. As a teacher, you need to achieve a balance between closed and open questions. Some studies of classrooms show that teachers find it easier to ask closed questions, but asking a majority of open questions would be better because these questions stimulate thinking and creativity.

Conceptual, empirical and value questions

Another way of classifying questions is in terms of *conceptual questions*, *empirical questions* and *value questions*.

Conceptual questions can be initiated by classification-type activities. So, for example, for the classification of animals, a teacher could ask the students to assemble their own taxonomy (i.e. to sort the animals into different groups themselves). The teacher can then ask questions related to the students' classification, for example:

• Do you think all animals that lay eggs should be in one group?

• Can you explain why you have put these animals together?

• What do you call animals with and without bones?

Here the teacher is beginning to develop the students' conceptual ideas (such as the distinction between vertebrates and invertebrates). By reflecting on their own classification in relation to

these conceptual ideas, the students begin to construct an understanding of the world that is much stronger than if they were just told about how to classify animals and how taxonomies work. The textbook classification could then be introduced as another basis for discussion.

Empirical questions involve observation, recall of facts and possibly experimentation. Read the following two transcripts. The first transcript is from a lesson about forces; the second is about how animals keep warm. The researchers noticed how the teachers structured the empirical questions and how the questions helped the student to observe, speculate and connect one fact with another.

Read carefully for the ways in which the two teachers extend some of the questions.

Transcript 1

Teacher: When I blow up the balloon, which is inside a plastic cup, Saif said that the air presses against the side of the cup and lifts the cup up with the balloon. So what do you think is going to happen if I let go of the cup?

Student: It's going to stay.

T: It's going to stay with the balloon. What if I start to let go of the balloon?

S: It will fall off.

T: Can you explain what you mean?

S: All the air will start coming out and friction on the side of the cup will start letting go, so then the friction will stop and then it will fall off.

T: Good, we've got another word here — friction — say it again really loud now so everyone can hear.

S: Well, when the air goes out, the friction will kind of come off the cup and then the friction will let go of the cup and then the cup will drop off.

T: Right! So Omar is saying that there is some friction holding the balloon and the cup and that when the air comes out of the balloon the cup is going to drop off — does anyone else think the cup is going to drop off? Who's not sure? So if you let go of it — the cup drops to the floor — right, OK, so you've got some cups in front of you and you've got four balloons so you can try it. Now, what have you got to be careful not to do during the experiment?

S: Don't let the air out!

T: Don't let the air out, keep it in, right. Now let's have a go in our groups and see what happens and think how you can explain what is happening. You might want to try it several times and see if it is the same each time.

Transcript 2

T: Yes, if we think about stables and barns, these are places that animals sometimes shelter in. Why do you think they do not always live outside?

S: Because there might be a strong wind and a dust storm.

T: Good, when is there most likely to be a strong wind and dust storm?

S: In winter.

T: Is it only in winter?

S: No, strong winds can happen anytime.

T: Are there other times when animals might need shelter?

S: At night.

T: Good, why at night?

(Modified from Brown, G. A. & Wragg, E. C., 1993, Questioning, London: Routledge)

Let's now look at *value questions*, which relate to the values you may be exploring with the students. This might occur when you are discussing topics such as human rights or conservation of the environment. For example, "How could climate change affect students' human rights?" could provoke much discussion about how access to clean water may be jeopardised by flash floods and drought caused by global warming. Any parts of the curriculum where rights or injustices are being discussed and where sometimes there will be different opinions, fall into the values category. Such questions allow students to formulate and think about their own opinions and understanding about a topic.

The different ways of classifying questions show how certain types of questions foster learning more than others. All the types of questions are useful, but questions that make students think (rather than questions that just require memory recall) should feature significantly in a teacher's questioning strategies.

On a day-to-day basis, you do not need to have the classification of questions in the forefront of your mind! But you do need to ensure that you develop strong questioning techniques that extend your use of the more challenging types of questions in order to help students progress more. The skill of good questioning is one of the most important ways of raising students' achievements.

Question 5: Why Are Explaining Skills So Important for Successful Teaching?

See Key Resource 12.

COMMENTARY

Everyone has had the experience of not understanding an explanation. People who are really skilled at doing something (a computer specialist or a car mechanic, for example) are not necessarily good at explaining things. But explaining, like questioning, is at the heart of the teacher's job.

There is a difference between describing and explaining. You could describe something by just reading out of a book. Explaining means that you have to think about creative ways to help your students understand an idea or concept.

Good teachers will often explain things two or three times in different ways to help students understand. As a teacher, you do not expect to immediately understand a new technique or strategy the first time you hear about it. The same is true for the students you teach. The challenge for you is that teachers have to explain things to a whole class. Some students may pick something up quickly, while others need longer (and different explanations) to understand a topic fully. What we do know is that just explaining something once to a class and then moving on will leave some students behind. All aspects of an explanation need careful thought.

Good teachers are good at explaining things. This is not a skill you are born with! It has to be thought about and practised. Explanations help us to understand a variety of things, including:

- concepts (e.g. what we understand by "density" or "prejudice");
- cause and effect (e.g. rain being caused by the cooling of the air);
- procedures (e.g. how to convert a fraction to a decimal);
- purposes and objectives (e.g. what students are expected to have learned at the end of a topic);
- relationships (e.g. why flies and bees are insects, but spiders are not); and
- processes (e.g. how a machine works).

These are the main, but not the only, types of explanation that you might use as a teacher. It is easier to become a better explainer when you know the main features of the explaining process. These are:

- the keys, or main ideas, of the explanation;
- the explainer's voice; and
- the sequence and structure of the explanation.

Keys

What are the "explanation keys" that help unlock understanding? A key may be a central principle or idea, or a generalisation. For instance, if someone were describing a recipe for making an omelette, then the notion of "heat" would be important (too little heat and the omelette does not cook; too much and it burns!). It is not too difficult to think of other keys when making an omelette, such as taste, texture and health.

These "key" ideas will vary according to what you want the students to know and understand. In teaching, it is very important to be able to sort out the really important ideas from the facts that describe them. This process has been compared with the idea of a tree. The main trunk is the really central key concept (understanding) that you want students to learn. The big branches are the major keys to developing that overall understanding. The leaves or pine needles are the small facts that help you build the understanding of the key ideas. It is important to make sure that your explanations focus on the trunk and branches and that the leaves do not obscure this.

In preparing an explanation, you need to think about what you will do to gain students' interest, how you will explain and sequence the ideas and what kind of voice you will use to do this. First, we will think about the voice, as this can be greatly underused or misused, which can have a negative impact on the students' interest.

Voice

The voice of the explainer is important — is it pleasant and well modulated, or flat and tedious? Does the teacher shout? Does the teacher make eye contact as they explain? Good teachers use a change of voice to give messages about the explanation.

See, for example, how one teacher explained what volcanoes are, by telling a story about one of the world's biggest volcanic explosions, Krakatoa, in 1883.

"And do you know," she said,

"A whole island was blown into pieces."

[pause] "… people just disappeared."

"The debris from the explosion went high [gesture with hands towards the sky] into the sky."

"And what was really interesting," [pause]

"… was that the dust from Krakatoa went up into the Earth's atmosphere and circled the world giving deep red sunsets for many years to come."

"Now let me ask a question." [pause]

"Why do you think the world's sunsets became so red?"

The teacher here used questions, structure, gesture, her voice and pauses to aid the explanation. She probably also used facial expressions to enhance her explanation. Communicating information goes beyond just saying the words.

As you plan your explanations, think about how you can maximise the impact of what you say by the way you use your voice and other communicative strategies.

Sequence

It is important to think about the sequence of key points in your explanation. For example, it could be useful to write up key words in advance or perhaps to have a sequence of posters. You might also use the textbook to guide the students and explain ideas so that they understand the difference between key ideas and facts, and the sequence in which they need to think about them.

However, if you do use the textbook, remember that your purpose as a teacher is to explain in an active way what can only be set out passively in a textbook. You need to take the explanation in the textbook and explain it in a more dynamic way. This will make the students more curious and interested than they would be from just reading the textbook. A student's mind, or any of our minds for that matter, does not always follow the sequence that a textbook author has set out, any more than we ever use the manual for a computer or electronic gadget by reading it through from the first to last page. Some of the most passive teaching is when the teacher merely follows or reads the textbook through. Active teaching is much more than that!

A great deal of good teaching is spontaneous. The teacher uses the students' ideas and answers to questions to build an explanation. But good teachers still plan in advance. For example, a teacher preparing a topic will need to think about at least three levels of planning:

- What is the general purpose of the activity?

- What are the keys to the explanation?

- What strategies can be used to help the students understand the keys to the explanation?

ANOTHER TEACHER'S EXPERIENCE

Betty was introducing the topic of volcanoes to her class. She planned the topic, which would last about four teaching sessions over the week, in the following way.

The main idea she identified was that the Earth's surface has been caused by "cooling" but that weak spots still exist, which cause volcanoes.

Next, she decided on some key ideas or concepts to include in her lessons, which included "crust," "magma," "pressure" and "plugs." She made cards with one of these words on each and put them around the classroom.

Betty then planned an opening explanation. She decided to bring in a pan of milk that she had heated just before the lesson. She would put the pan on her desk and get the students to describe what happens when milk cools. This would be a question/answer brainstorming session and she would put key words about cooling on the board; she would make sure that "crust" or "skin" was one of them.

She decided not to do further explanation at this point, but to arouse the students' interest more by telling them the story of Krakatoa. She had a map of the world to show where Krakatoa had been. She also had a book with "eyewitness accounts" of what had happened at the time.

Betty's lesson went well. The students were all involved in the milk brainstorm and the story of Krakatoa really caught their imaginations.

COMMENTARY

You can see from Betty's experience above how it is possible to put ideas and facts in place without necessarily immediately showing the connections. An explanation can be more powerful if the connections are made slowly, rather as a detective puts the clues together to solve a crime.

As you move into a topic, the students may make connections themselves — always the most effective way of learning. By not providing connections too soon, you allow the process to happen. The students can do this together, in pairs or groups, as a "community" of learners. But you can only allow a limited amount of time for this. If you have to go further into the explanation, then remember that there are four essential features when explaining concepts:

- **Labels or names:** These are the actual words used to name a concept (e.g. "crop," "reptile," "electricity").

- **Attributes:** These are either "must have" attributes, which are essential to the concept (e.g. wings are a "must have" attribute of birds) or "may have" attributes (e.g. the colour brown applies to some birds).

- **Examples**: These are either actual examples that meet the criteria (e.g. pigeons are examples of birds) or non-examples that help define the actual criteria (e.g. dragonflies are not birds).

- **Rules**: This is the full definition, listing the "must have" attributes and their relationship to each other.

For example, if you were teaching something about insects, the four essential features might be as follows:

Name or label:	Insect
Attributes:	Must have six legs, head, thorax, abdomen, two antennae, and wings. May live in a desert habitat; may have a black or brown body and stripes.
Examples:	Examples – beetle, wasp Not examples – scorpion (arachnid), snail (gastropod)
Rules:	Insects have six legs, a head, thorax and abdomen, two antennae and two or four wings.

It is really helpful to listen to other teachers when you are thinking about the best way to explain things. What stories do they tell? What images do they bring up? What jokes do they tell? Studies of good teachers show that they develop a rich repertoire of ideas and methods that they draw on when explaining things. All teachers need to develop similar strategies.

Now read how one teacher thought carefully about interesting ways to begin her explanation of a new topic.

ANOTHER TEACHER'S EXPERIENCE

Sawsan was going to teach a Grade 7 class about insects. When she had taught the topic last year, she had relied primarily on the textbook. She found the students were quite interested in the topic. Insects existed all around them and it had been possible to draw on their knowledge in discussions of the topic. But this year Sawsan thought she could do better and wanted to make the lesson more interactive.

She decided to plan the opening of the topic around three things. She wanted to:

* arouse the students' curiosity;

* find out in more detail what they already knew; and

* tell the students what they would cover in the two weeks they would be studying the topic.

To arouse curiosity, she remembered a science fiction story that had been made into a film. In the story, the Sun had one day turned a shade of mauve. During this day, the Sun's rays had shone down on all the insects of the world and made them grow much bigger, bigger than humans. She decided she would tell this story, remind the students how many insects there were in the world and then ask them to imagine what the world would be like if this really happened. The main aim of this would be to help the students think about just how many insects there were and how many different species there were. The students would have to use their imaginations in thinking what a world with enormous insects would look like. The students thoroughly enjoyed sharing their ideas of a world of such large insects!

Next, Sawsan tried to find out what the students already knew about insects. To do this, she asked them to work in pairs. They had to think about and write down everything they knew about insects on a piece of paper. These ideas were then shared with the whole class.

Sawsan was pleased at what the students already knew and used this to plan the next sessions in more detail so that they became familiar with local insects and the general characteristics of insects.

COMMENTARY

Sawsan's use of the story to engage the students' interest and arouse their curiosity had the desired effect. The telling of the story did not take much time out of the lesson and the rewards it brought in terms of motivating the students were well worth the time.

Capturing students' interest in a new topic and explaining the topic need careful thought and planning. There are many ways that you can start to explain a topic, from talking about it to using pictures, drama, poetry, stories, music or inviting an expert in to talk to the class. It is important to vary the strategies you use so that the students' curiosity is aroused.

The next activity asks you to think about a topic you are going to teach and how you might start to explain it.

Activity 8: Thinking about your own ways of explaining something

Think about a topic you will be doing with a class in the next two weeks. Make a note of:

• how you plan to arouse the students' curiosity about the topic; and

• how you are going to explain what they will be studying in this topic.

You will need to think about what to use. For example, a picture, a story, music or some other kind of stimulation may gain the students' attention and arouse their curiosity. Think about how you will explain your aims for the lesson and introduce the students to the subject matter again so that they want to learn more.

Teach the lesson and then discuss with other teachers how well the students responded to your introduction to the lesson. How well did your explanations go? How do you know this? Did the students understand better what was expected of them in this lesson? How do you know this?

Question 6: How Can Teachers Improve Their School and Subject Knowledge?

The Key Resources are generic in structure and not so relevant to this particular question. However, there are globally a great many subject associations and organisations with helpful websites. In Science, for example, there is the Association for Science Education at www.ase.org.uk, the Australian Science Teachers Association at www.asta.edu.au, the Science Society of India at www.sciencesociety.in and The Wellcome Foundation at www.wellcome.ac.uk. All provide useful resources for Science teachers. Similar resources exist in all the major secondary school subjects.

COMMENTARY

In the next two questions you are asked to think about the main subject you teach at secondary school. You will be thinking about your own subject knowledge in **Question 6** and the specific ways of teaching that subject in **Question 7**. But first it is important to show the ways in which these two questions link together.

Over the last decade or more, there has been an increasing interest in what has come to be called **pedagogic content knowledge**. There are a variety of ways of understanding this. Here you are asked to look at one perspective that is of particular value to teachers involved in school-based development. Look at this diagram:
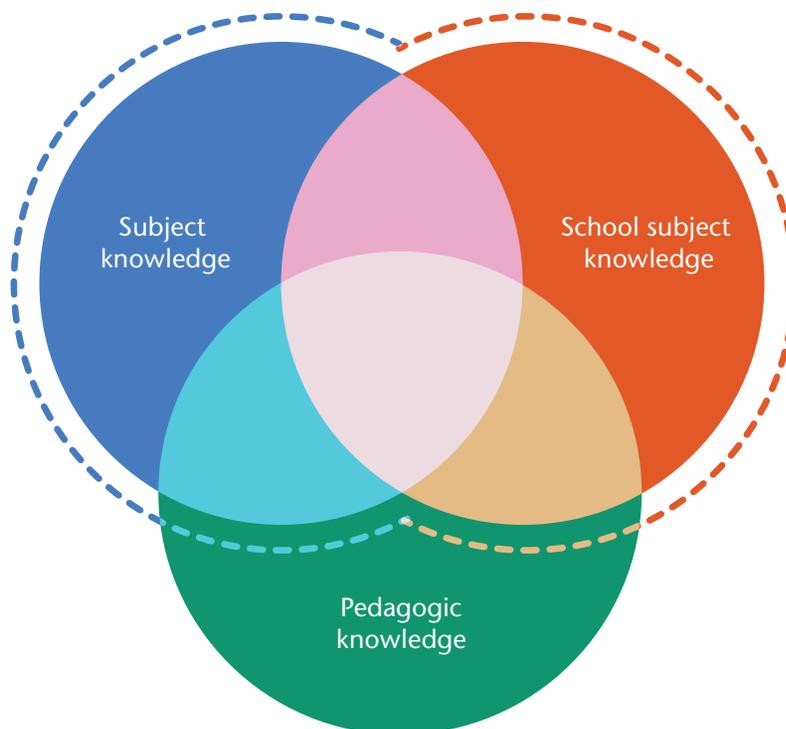
You see three overlapping circles. The circle on the left is called **subject knowledge**; this is the knowledge you have after studying at college or university. The circle on the right is **school subject knowledge**; these are the changes made to syllabus and curriculum to take account of

the age of a learner. An 11-year-old might study Science, but the curriculum will have significant differences to the curriculum of a student at university.

There will be differences between subjects in terms of content and process. The Art or Drama teacher will think of subject knowledge in a rather different way than a Science or History teacher. However, whatever subject you teach, you will have ideas or objectives about what students need to know, understand and practise by the end of any teaching sequence.

School subject knowledge

You have your own subject knowledge, but now — as a teacher — you have to transpose what you know to the curriculum that is appropriate for an 11- or 14-year-old (or someone studying at that age level). How do you do this? Most teachers look at the syllabus. It is true that syllabus designers will have tried to take account of the subject content that is most appropriate for different ages. But the syllabus is often a description of topics and provides little insight into how you form those topics into teaching plans.

Much closer to a teaching plan is a textbook. Not all classes have sufficient textbooks, but most teachers will have a copy. The textbook will take the subject content further into "how to teach." A good textbook author will think carefully about how learning is sequenced, the best examples to illustrate an idea, and the sorts of diagrams and pictures that will clarify learning around a topic.

The school curriculum represents a transposition between knowledge as it is known today and what we expect young people to be able to learn at different ages. Good teachers think carefully about this. A Geography teacher explaining why volcanoes exist will give a simpler explanation to nine-year-olds that the more extensive knowledge that could be given to a 16-year-old. The decisions about what you explain to the nine- or 16-year-old are important pedagogic or teaching decisions.

In recent years, curriculum planners and teachers have given the organisation and structure of knowledge much more attention. Two ideas have been particularly prominent:

•   the concept of the **spiral curriculum**; and

•   the development of **"Big Ideas"** in subject teaching.

The spiral curriculum

The idea behind the spiral curriculum is that topics once covered in class have to be revisited to ensure everyone fully understands an idea or concept. One of the main reasons children and young people fall behind in school is because they have insufficient time or stimulus to fully understand things. A teacher who only teaches something once may have taken some young people with them, but there will almost certainly be a group left behind.

Good teaching is not monotonously going through the syllabus and textbook. Good teaching means revisiting topics to deepen understanding and ensure no student is left behind; the spiral curriculum concept is a metaphor to remind us about the importance of the revisiting process.

After all, if you are explaining something to your own or a relative's children, you do not necessarily expect them to understand immediately. You might have to explain things in two or three different ways before they fully understand. The same process applies in the classroom. School knowledge needs to be organised in ways that allow students to think through ideas from a variety of perspectives.

Big Ideas

Linked to the spiral curriculum is the concept of Big Ideas in curriculum planning. The significance of thinking in this way (and the idea of the spiral curriculum) came from an American psychologist called Jerome Bruner. He said that it is important to be explicit about what the core knowledge of any subject is. Bruner argued that the teacher needs to understand the structure of knowledge so that they can make clear to learners what the key ideas are, how they relate to each other and how facts and content can be presented to make clear the network of linkages that must be understood when real understanding is achieved. Think about the work you did on explaining for **Question 5**.

Look at the diagram on the next page. This shows one developer's version of the Big Ideas approach in Biology. This version shows six Big Ideas (two for each of the three content areas) and suggests for each of the five years of a basic secondary-school course when ideas relating to the Big Ideas can be introduced. Thus, within the study of Ecosystems, you have the Big Idea that "Ecosystems recycle resources." The curriculum planners suggest that you could cover this through studying Respiration in year 2 and Photosynthesis in year 4. They are, therefore, creating a framework for more detailed curriculum planning to follow.

5YC Biology — Progression towards big ideas

Area	Big Idea (Central ideas, models, principles)	1	2	3	4	5
Organisms	Cells are alive	**Cells** · Cell structure · Specialised cells		**Growth & differentiation** · Stem cells · Cell transport · Cell division		
	Bodies are systems		**Tissues & organs** · Gas exchange · Cell organisation · Digestive system		**Organ systems** · Circulatory system · System damage	**Feedback & control** · Control systems · Enzymes
Ecosystems	Organisms are interdependent	**Interdependence** · Feeding relationships · Competition · Abiotic & biotic factors		**Human interaction** · Biodiversity · Communicable disease		
	Ecosystems recycle resources		**Respiration** · Aerobic respiration · Anaerobic respiration		**Photosynthesis** · Photosynthesis · Plant transport	
Genes	Characteristics are inherited	**Reproduction** · Sexual & asexual · Menstrual cycle · Embryo development		**Genetics** · Genes · Monohybrid inheritance	**Controlling reproduction** · Reproductive hormones · Genetic engineering	
	Species show variation		**Evolution** · Variation · Natural selection · Selective breeding			**Life diversity** · Evolutionary evidence · Adaptation

Source: www.masteryscience.com

A few years ago, leading Science educators from all parts of the world came together to formulate the Big Ideas in school-level Science (see www.ase.org.uk/resources/big-ideas). Here is what they came up with:

Ideas of science

1. All material in the Universe is made of very small particles.

2. Objects can affect other objects at a distance.

3. Changing the movement of an object requires a net force to be acting on it.

4. The total amount of energy in the Universe is always the same but energy can be transformed when things change or are made to happen.

5. The composition of the Earth and its atmosphere and the processes occurring within them shape the Earth's surface and its climate.

6. The solar system is a very small part of one of millions of galaxies in the Universe.

7. Organisms are organised on a cellular basis.

8. Genetic information is passed down from one generation of organisms to another.

9. Organisms require a supply of energy and materials for which they are often dependent on or in competition with other organisms.

10. The diversity of organisms, living and extinct, is the result of evolution.

11. Science assumes that for every effect there is one or more causes.

12. Scientific explanations, theories and models are those that best fit the facts known at a particular time.

13. The knowledge produced by science is used in some technologies to create products to serve human ends.

14. Applications of science often have ethical, social, economic and political implications.

[236 words quoted.] (Harlen, W. (ed.), 2010, *Principles and Big Ideas of Science Education*, Preface)

> **Activity 9: Identifying Big Ideas in subject teaching**
>
> Look at the list on the previous page. In your subject group, discuss how you could create a similar kind of list. What "Big Ideas" do you think there are in the subject you and your colleagues teach? Write out the list. Do you think the syllabuses you are teaching, and the textbooks you are using, fully reflect the Big Ideas you have identified?
>
> If you are in a Science department, look again at the list on the previous page. Are there any changes you would make to this list? Do you think the syllabuses you are teaching, and the textbooks you are using, fully reflect the Big Ideas identified for Science?

COMMENTARY

All the evidence suggests that when teachers think about the structure of their subject, they become better at creating the frameworks of understanding that are so important in subject teaching. It is clearly impossible for young people to carry in their heads the sort of framing that you, or a textbook writer, have after years of study. You need to be able to build such frameworks of understanding, as well as explaining the content of the subject. This means thinking carefully about the subcategories of information that will help students understand a Big Idea. For example, look at Big Idea 5 from the scientists' list and the first elaboration of this idea:

5. The composition of the Earth and its atmosphere and the processes occurring within them shape the Earth's surface and its climate

Radiation from the Sun heats the Earth's surface and causes convection currents in the air and oceans, creating climates. Below the surface heat from the Earth's interior causes movement in the molten rock. This in turn leads to movement of the plates which form the Earth's crust, creating volcanoes and earthquakes. The solid surface is constantly changing through the formation and weathering of rock.

[88 words quoted.] (Harlen, W. (ed.), 2010, pp. 21–22)

The curriculum designers elaborated this even further by suggesting which concepts could most appropriately be taught at different ages. For example, for 5–11 years:

FOR 5 –11 YEARS:

There is air all around the Earth's surface but there is less and less further away from the surface (higher in the sky). Weather is determined by the conditions and movement of the air. The temperature, pressure, direction, speed of movement and the amount of water vapour in the air combine to create the weather. Measuring these properties over time enables patterns to be found that can be used to predict the weather a short time ahead.

Long-term patterns in the weather are referred to as the climate of different parts of the world.

Much of the solid surface of the Earth is covered by soil, which is a mixture of pieces of rock of various sizes and the remains of organisms. Fertile soil also contains air, water, some chemicals from the decay of living things, particularly plants, and various living things such as insects, worms and bacteria. The solid material beneath the soil is rock. There are many different kinds of rock with different compositions and properties. The action of wind and water wears down rock gradually into smaller pieces – sand is made of small pieces of rock and silt of still smaller pieces. About two-thirds of the surface of the Earth is covered by liquid water, which is essential to life. Water is constantly recycled through processes involving evaporation from oceans and other surfaces, such as soil and plants, condensation in clouds and precipitation as rain, snow or hail.

[241 words quoted.] (Harlen, W. (ed.), 2010, p. 32)

FOR 11–14 YEARS:

The layer of air at the Earth's surface is transparent to most of the radiation coming from the Sun, which passes through. The radiation that is absorbed at its surface is the Earth's external source of energy. Radioactive decay of material inside the Earth since it was formed is its internal source of energy. Radiation from the Sun provides the energy that enables plants containing chlorophyll to make glucose through the process of photosynthesis. The radiation from the Sun absorbed by the Earth warms the surface which then emits radiation of longer wavelength (infra-red) that does not pass through the atmosphere but is absorbed by it, keeping the Earth warm. This is called the greenhouse effect because it is similar to the way the inside of a greenhouse is heated by the Sun.

[133 words quoted.] (Harlen, W. (ed.), 2010, p. 32)

FOR 14–17 YEARS:

Oxygen in the atmosphere, produced by plants during photosynthesis, indirectly protects the Earth from the short wave (ultra-violet) part of the Sun's radiation which is harmful to many organisms. The action of ultra-violet radiation on oxygen in the upper atmosphere produces ozone which absorbs this harmful radiation. The temperature at the Earth's surface results from a delicate balance, which can be upset by adding gases to the atmosphere. Human activities produce carbon dioxide and methane which increase the greenhouse effect and leads to global warming and climate change.

Beneath the Earth's solid crust is a hot layer called the mantle. The mantle is solid when under pressure but melts (and is called magma) when the pressure is reduced. In some places there are cracks (or thin regions) in the

crust which can allow magma to come to the surface, for example in volcanic eruptions. The Earth's crust consists of a number of solid plates which move relative to each other, carried along by movements of the mantle. Where plates collide, mountain ranges are formed and there is a fault line along the plate boundary where earthquakes are likely to occur and there may also be volcanic activity. The Earth's surface changes slowly over time, with mountains being eroded by weather, and new ones produced when the crust is forced upwards.

[220 words quoted.] (Harlen, W. (ed.), 2010, p. 32)

These are examples from a part of the Science curriculum that everyone will be familiar with. It is set out here to illustrate how Big Ideas are developed into plans for a syllabus.

Activity 10: Identifying "Big Ideas" in your subject

For this activity, work together as a subject department. Take the syllabus for the first term you teach students when they join your school (this will usually be at age 11/12, although in some subjects it might be a little later).

Identify the "Big Ideas" you feel you are teaching in this first term. There may be just one, perhaps two or three, but not more than that. Then briefly write out the subcategories of the Big Idea concept(s) you have identified.

The purpose of this activity is for you to engage with the structure of your subject. You will find plenty of Internet information if you wish to deepen your enquiries on this theme. Keep the lists you have drawn up, as they will be needed in the next activity.

COMMENTARY

Network plans

You are being asked to think about the structure of the subject you teach. Some curriculum planners have suggested that subject and topic networks are a good way to illustrate the interconnections between parts of a subject. The state of Victoria in Australia, for example, has done this for all the main topics in every Science subject. Look at the example on the next page.

Changes in the Earth's Surface

Earthquakes often occur along the boundaries between colliding plates, and molten rock from below creates pressure that is released by volcanic eruptions, helping to build up mountains. Under the ocean basins, molten rock may well up between separating plates to create new ocean floor. Volcanic activity along the ocean floor may form undersea mountains, which can thrust above the ocean's surface to become islands.
ⓘ *Structure of the Earth*
🌐 Plate Tectonics

Scientific evidence implies that some rock near the Earth's surface is several billion years old.
🌐 Natural Selection

The formation, weathering, sedimentation, and reformation of rock constitute a continuing "rock cycle", in which the total amount of material stays the same as its forms change.

The interior of the Earth is hot. Heat flow and movement of material within the Earth cause earthquakes and volcanic eruptions and create mountains and ocean basins.
ⓘ *Structure of the Earth*
🌐 Plate Tectonics

Sedimentary rock buried deep enough may be reformed by pressure and heat, perhaps melting and recrystallising into different kinds of rock. These reformed rock layers may be forced up again to become land surface and even mountains. Subsequently, this new rock too will erode. Rock bears evidence of the minerals, temperatures and forces that created it.

Thousands of layers of sedimentary rock confirm the long history of the changing surface of the Earth and the changing life forms whose remains are found in successive layers. The youngest layers are not always found on top, because of folding, breaking and uplift of layers.

The Earth first formed in a molten state and then the surface cooled into solid rock.
🌐 Plate Tectonics

Some changes in the Earth's surface are abrupt (such as earthquakes and volcanic eruptions) while other changes happen very slowly (such as uplift and wearing down of mountains).
ⓘ *Geological time*
🌐 Plate Tectonics

The Earth's surface is shaped in part by the motion of water (including ice) and wind over very long times, which act to level mountain ranges. Rivers and glacial ice carry off soil and break down rock, eventually depositing the material in sediments or carrying it in solution to the sea.
ⓘ *Geological time*

Sediments of sand and smaller particles (sometimes containing the remains of organisms) are gradually buried and are cemented together by dissolved minerals to form solid rock again.

There are many different land forms on the Earth's surface (such as coastlines, rivers, mountains, deltas and canyons).

Vibrations in materials set up wavelike disturbances that spread away from the source. Sound and earthquake waves are examples.
ⓘ *Structure of the Earth*
🌐 Plate Tectonics
🌐 Waves

Waves, wind, water, and ice shape and reshape the Earth's land surface by eroding rock and solid in some areas and depositing them in other areas, sometimes in seasonal layers.

Things on or near the Earth are pulled toward it by the earth's gravity.
🌐 Gravity

Rock is composed of different combinations of minerals. Smaller rocks come from the breakage and weathering of bedrock and larger rocks. Soil is made partly from weathered rock, partly from plant remains, and also contains many living organisms.

How fast things move differs greatly. Some things are so slow that their journey takes a long time.

Things change in steady, repetitive, or irregular ways, or sometimes in more than one way at the same time.

Some changes are so slow or so fast that they are hard to see.

Change is something that happens to many things.

Chunks of rocks come in many sizes and shapes, from boulders to grains of sand and even smaller.

earthquakes and volcanos

rates of change

weathering and erosion

rocks and sediments

Source: www.education.vic.gov.au/Documents/school/teachers/teachingresources/discipline/science/continuum/earthsurface.pdf

Activity 11: Connecting topics in a network plan

Take the document you produced for the last activity. Produce a network plan that you could share with students when they begin working on this topic. It will not be as detailed as the example on the previous page, but it should structure the content in ways that show the links between topics and ideas.

As you prepare this network plan, think about how it could be used. For example, you could refer to it at the beginning of the first lesson in each week. Or it could provide the focus for looking back on what was covered the previous week and looking forward to the new topics to be covered.

COMMENTARY

The interest in the spiral curriculum, Big Ideas and network planning has existed for many years. It is only now, however, beginning to have an impact on syllabus structure and textbook writing. You might like to look individually, or as a subject department, at the syllabus and textbook you work with. Do they reflect some of the ideas discussed here? Or would you need to produce some plans of your own to make the Big Ideas clearer? Students need routes through a topic or subject. If students come to class in the middle of studying, say, ecosystems or the structure of the Earth, and have no idea what will be covered in coming lessons then they will find connecting up different ideas and concepts difficult.

In answering **Question 6**, the focus has been on the structure and content of the subject. The argument is that subject teachers need to be much more explicit about this and not just rely on the syllabus or textbook in an implicit way. The next question, **Question 7**, will focus on how your knowledge of the subject and your knowledge of how the subject can be used at different levels of the curriculum can be linked to pedagogy generally and the teaching methods you choose to use.

Question 7: How Can the Teaching of Your Subject Be Improved?

Nearly all the Key Resources can be drawn on in examining this question.

COMMENTARY

The last question focused on your subject knowledge. We looked at the importance of structuring or scaffolding knowledge around "Big Ideas" or core concepts. This question looks at the pedagogic means by which you teach these central ideas.

A good teacher builds up a collection or repertoire of strategies and techniques through which different aspects of their subject are learned most effectively. The activity below asks you to work with a colleague or colleagues to brainstorm possible strategies you could use.

Activity 12: Collecting pedagogic ideas

With a colleague, or in your subject group, select one topic area you teach. Brainstorm the teaching methods you could adopt. For example, you might use some equipment, you might tell a story or you may find a particular approach to pair or group work is most effective. Have at least four examples of techniques that could be used.

COMMENTARY

Look again at the diagram below. We are focusing here on the third circle.
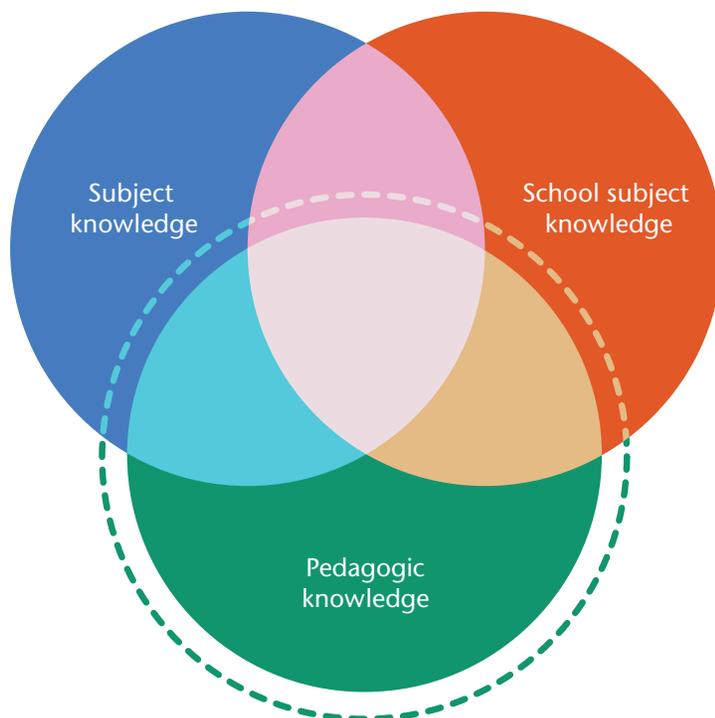
Pedagogic strategies

SBTD is about sharing ideas. But this means more than just a casual conversation. Just as a doctor will develop certain ways of treating illness (updated to take account of new medical research), so a teacher builds up knowledge of teaching topics and subjects. Perhaps in education we have not been so good at recording and cataloguing such knowledge. But times are changing. The days when a teacher would go into the classroom and just teach from the textbook, or when the teacher knew about what was happening in their classroom but no one else's — these are models that can now be seen as too solitary.

ANOTHER TEACHER'S EXPERIENCE

One group of Geography teachers decided to use the idea of "mysteries" as a pedagogic strategy. The teachers identified a number of natural phenomena that they were required to teach about. They then selected one that they wanted to focus on — volcanoes. Here is how they designed the pedagogic teaching method for the topic:

First, they prepared a presentation (8–10 minutes) on the Krakatoa volcanic explosion of 1883 in what is now Indonesia. The force of very hot magma meeting cooler magma blew up a whole island. Debris from the volcanic activity spread into the atmosphere and turned sunsets bright red all year round. The teachers found an account of the explosion written by a sailor who was in the vicinity of Krakatoa. The presentation also included a mention of a volcanic explosion in Iceland in 2010 that caused flights to be cancelled in many parts of the world, especially Europe. One teacher in the group did the preparation of the presentation and each Geography teacher used it to present to their class.

Next, the teachers produced 15 cards with pieces of information that helped explain the mystery of how volcanic eruptions occur. Each card had letter identification. The cards were juggled up. The students in groups then had to put the cards in order to make up an answer to the mystery of volcanoes. They then put their chosen letter sequence on the board at the front of the class. The teacher then did a question-and-answer session with the class before revealing the correct sequence (which the students then copied out in their exercise books).

Finally, the teachers prepared a short test. The explanation about volcanoes was written down with three key sentences marked but missing. The students had to fill in the spaces. Each teacher used this as a first evaluation of how well the students had learned and understood the topic.

The use of the cards motivated the students and the teachers used the approach on other topics. For example, in one case, a group of 12-year-olds were doing a "mystery" that concerned the disappearance of a tribe of Amazonian Indians. The slips of paper included information about:

- gold prospectors;
- water pollution;
- infectious diseases;
- hunting practices; and
- poverty among the non-Indian population.

One group of four boys were having great difficulty with the mystery. The teacher visited them and pulled out a data item about the tribe's water supply. She then asked them to find any other data items about water and left them to work alone. With this action, the teacher had diagnosed a weakness shared by the whole group in classifying/grouping data and demonstrated how they could undertake the next stage in working towards a solution. When the students had grouped several data items about water, the teacher returned to suggest that they might form a group about diseases and health. This enabled her on a third visit to start asking them about the possible connections both within and between the two groups of data items. The students thus took their first steps towards formulating an explanation.

In another case, a group of 14–15-year-olds were doing a "mystery" that focused on who was to blame for the need to demolish a block of (public housing) flats in a nearby city. The data items included reference to:

- the faulty materials and technology used in the building;

- the antisocial behaviour of some of the residents;

- the destruction of the community which lived in the terraced houses that were cleared to build the high-rise blocks;

- the physical deterioration of the building; and

- the fears of residents in the flats with young children.

One group of girls had initially sorted their data into two groups: one representing reasons for the demolition and the other against. But, in fact, they were not addressing the specific task and so were classifying in an unproductive way. When their teacher pointed this out to them, they realised that although they had looked at the reasons for the demolition, they had not been looking specifically at the question of who was to blame. They then began to attribute each data item to the person or entity that was responsible, for example the builders who built the flats or the residents who were antisocial. It was then easier for them to re-sort the data. This time they formed groups related to the local council, the builders, the antisocial residents and the government.

COMMENTARY

These Geography teachers were exploiting the potential that active learning situations create. If students have to "do" something, they are more likely to be engaged with the topic and motivated by the learning that is taking place. That is not to say that all teaching has to be active in this way. There will be lessons when working through a section of a textbook by a whole class is appropriate. At other times, individual work around a theme may be necessary to allow the teacher to move around the class and check on progress. It is the task of the teacher to choose the right combination of approaches.

Providing feedback

Whatever the tasks set and however they are presented, students need feedback on their work. This is a crucial part of any teaching approach and it is important to think about the varied ways this can be done.

ANOTHER TEACHER'S EXPERIENCE

Omar was concerned about the quality of feedback he was giving to his Grade 8 Physical Science students. Most of the time, he just gave marks with the occasional comment. But Omar had participated in a recent teachers' meeting where he heard how research had showed that commenting on students' work was very important.

However, although Omar knew this was important, he also knew it was difficult to do because he had a large class and commenting in detail took a long time. After thinking about this, he came up with a new approach.

He would try to talk to every student individually every term and then write a comment following their discussion. He told the class that they would have this regular discussion and they kept a rota on the wall. In the meetings with each student, he talked with them about their progress and about areas they were having difficulty with and suggested ways to help them learn better.

He also told the class that at least every six weeks he would write more detailed feedback on how they were each doing in their exercise books and then they would take their books home so they could share the feedback with their families.

COMMENTARY

There is strong evidence that making comments on students' work is really significant. One study a few years ago discovered that the students in classes where the teacher gave comments rather than just marks made better progress. So Omar was going in the right direction! Feedback only in terms of marks or grades is unlikely to improve learning, but comments (written and oral) do. But the comment is best when it is more than just "Well done" or a similar short phrase.

Remember always that your comments should provide a prompt to help the student to move forward. A question, therefore, can be more effective at helping understanding than just giving the student the information. You might need two or three questions to elicit the understanding, but this develops a very powerful approach to teaching and learning. For example, you could say to a student: "This is good so far, but have you thought about which factors affect your breathing rate? You could write in your ideas about this at the end."

Some teachers have developed sets of cards that they use when giving feedback. The cards might have some half-completed statements on, such as:

- Have you thought about …

- Discuss this with your partner …

- Look in your book on page …

The teacher moves quickly around the class giving out cards to some and filling in the spaces appropriately. For example: "Have you thought about comparing the right- and left-hand sides of the table?" Or: "Look in your book on page 63. Look especially at the diagram." Students often like the idea of getting a card. And it's a quick way for the teacher to establish a dialogue with a larger number of students.

In giving feedback, it is wise to use a variety of techniques and strategies to keep students interested and to help you engage with as many students as you can.

Keeping track of the feedback you give is useful — this will ensure that no student is left out and it helps you to track all the students' progress.

Activity 13: Assessing your levels of feedback

Draw a chart with the names of the students in one of the classes you teach down one side and lessons you will be teaching them in the next one or two weeks along the top.

Every time you have an individual "feedback" discussion with a student, put a tick against their name in the appropriate box. If the feedback was extended (i.e. you had to spend more time than normal or go back to the same student a number of times), put an asterisk against the tick.

At the end of the period of time you have selected, reflect on the following questions:

- What percentage of the class were you able to speak to?

- Did the percentage you achieved ensure that you would be able to give feedback to every student within a two- or three-week period?

- Did you manage to speak to those who might be finding the topic difficult?

- Did you manage to give feedback to those finding the topic fairly easy? Were you able to give them a supplementary, more demanding, task?

- What types of feedback did you give?

- Was the feedback helpful to the students? How do you know this? For example, did they finish the work without further help? Did they write a clear explanation that showed they understood the ideas?

COMMENTARY

Using a language of assessment with students is not a mechanical process where you just say "Well done" or "This needs more work." It involves more thought about how to help the student in their learning because this will make a difference to their achievement. Many teachers do

this as a matter of course. But if you want to improve and develop your practice (even the most experienced among us need to do that!), then you need to think explicitly about what you are doing and saying to students.

As discussed, there is now quite substantial research evidence that underpins how important good-quality feedback is. Stop and reflect on the following important findings, which provide guidance on ways to enhance your skills in providing feedback.

- Written and oral feedback can be equally effective if each is given in some depth.
- Giving praise is valuable, but praise that is specific to the task and mentions attributes of the task that have been well done is more effective than general praise.
- Feedback is more effective if it is focused on the task rather than the general personality of the student.
- Feedback on behaviour and presentation may be necessary, but it should be alongside consistent feedback on tasks.
- Feedback should always indicate a future action (i.e. what the student should do next), given the discussion you have had with them.
- Mistakes should be seen as important learning opportunities.
- Whole-class feedback can be helpful. For example, "You have all done very well this lesson. I think everyone now understands how to balance simple chemical equations."
- The student needs to see the feedback as useful, and so how you give the feedback must be sensitive to the student as a learner and a person.

You have looked at a number of detailed examples of good pedagogic planning and implementation. This is a good moment to stand think in overall terms about teaching methods and approaches. A very useful Australian website (www.evidencebasedteaching.org.au/evidence-based-teaching-strategies) has summarised the strategies that appear to really work in practice. The list that follows is based on solid researchevidence.

Eight key strategies for successful teaching and learning

1 **Evidence Based Teaching Strategy 1: Clear Lesson Goals**

It is crucial that you are clear about what you want your students to learn during each lesson. The effect that such clarity has on student results is 32% greater than the effect of holding high expectations for every student (and holding high expectations has a sizeable effect). If you cannot quickly and easily state what you want your students to know and be able to do at the end of a given lesson, the goal of your lesson will be unclear. Clear **lesson goals** help you (and your students) to focus every other aspect of your lesson on what matters most.

2 **Evidence Based Teaching Strategy 2: Show & Tell**

You should normally start your lessons with **show and tell.** Put simply, **telling** involves sharing information or knowledge with your students while **showing** involves modelling how to do something. Once you are clear about what you want your students to know and be able to do by the end of the lesson, you

need to **tell** them what they need to know and **show** them how to do the tasks you want them to be able to do. You don't want to spend your entire lesson having the kids listening to you, so focus your show and tell on what matters most. To do this, have another look at your lesson goal.

3 Evidence Based Teaching Strategy 3: Questioning to Check for Understanding

Research suggests that teachers typically spend a large amount of teaching time asking questions. However, few teachers use questions to check for understanding within a lesson. However, you should always check for understanding before moving onto the next part of their lesson. Techniques such as randomised sampling, student answer-boards and tell-a-friend help you to check for understanding before moving on from the show and tell part of your lesson while you can use other questioning techniques at different stages of your lesson.

4 Evidenced Based Teaching 4: Summarise New Learning in a Graphical Way

Graphic outlines include things such as mind maps, flow-charts and Venn diagrams. You can use them to help students to summarise what they have learned and to understand the interrelationships between the aspects of what you have taught them. Studies show that it doesn't seem to matter who makes the **summary graphic,** be it you or your students, provided the graphic is accurate. Discussing a **graphical summary** is a fantastic way to finish off your show and tell. You can then refer to it one more time at the end of your lesson.

5 Evidence Based Teaching Strategy 5: Plenty of Practice

As saying says, practice makes perfect. Practice helps students to retain the knowledge and skills that they have learned while also allowing you another opportunity to check for understanding. If you want to **harness the potent power of practice,** you must ensure that your students are practicing the right things. Your students should be practicing what they learnt during your show and tell, which in turn should reflect your lesson goal. Practice is not about mindless busy work. Nor does it involve assigning independent tasks that you haven't previously modelled and taught. Finally, research shows that students do better when their teacher has them practice the same things over a spaced-out period of time.

6 Evidence Based Teaching Strategy 6: Provide Your Students with Feedback

Feedback is the breakfast of champions, and it is the breakfast served by extraordinary teachers around the world. Put simply, giving feedback involves letting your students know how they have performed on a particular task along with ways that they can improve. Unlike praise, which focuses on the student rather than the task, feedback provides your students with a tangible understanding of what they did well, of where they are at, and of how they can improve. In Tiaon Hattie's view, any teachers who seriously want to boost

7 Evidence Based Teaching Strategy 7: Be Flexible About How Long It Takes to Learn

The idea that **given enough time, every student can learn** is not as revolutionary as it sounds. It underpins the way we teach martial arts, swimming and dancing. It is also the central premise behind mastery learning, a technique that **has the same effect on student results as socio-economic status** and other aspects of home life. When you adopt mastery learning, you differentiate in a different way. You keep your learning goals the same, but vary the time you give each child to succeed. Within the constraints of a crowded curriculum, this may be easier said than done; however, we can all do it to some degree.

8 Evidence Based Teaching Strategy 8: Get Students Working Together (in productive ways)

Group work is not new, and you can see it in every classroom. However, **productive group work** is rare. When working in groups, students tend to rely on the person who seems most willing and able to the task at hand. Psychologists call this phenomenon social loafing. To increase the productivity of your groups, you need to be selective about the tasks you assign to them and the individual role that each group member plays. You should only ask groups to do tasks that all group members can do successfully. You should also ensure each group member is personally responsible for one step in the task.

Activity 14: Identifying teaching strategies

Here we combine an activity with the experience of another teacher. You can do this activity individually or with a colleague.

Read "Another teacher's experience" below, which describes a Science teaching sequence for Year 8 students. As you read, make a note of any of the eight methods and approaches listed above that you see being used here.

ANOTHER TEACHER'S EXPERIENCE

Ann teaches Science in the early secondary years. She identified the following learning outcomes for a series of three lessons on plastics for a Year 8 class.

Students should be able to:

- distinguish questions that can be answered objectively by scientific investigations from those that involve decisions affected by cultural values and political issues;

- write an outline plan for an experiment to answer one of the questions that can be answered through scientific investigation.

Ann also aimed to develop the following aspects of the student competencies during the three lessons:

Communication and literacy

Students learn to:

- speak clearly and confidently, and listen carefully and respectfully to others;
- use a range of media to communicate their ideas.

Critical and creative thinking

Students learn to:

- plan and carry out investigations;
- sort and analyse information and come to conclusions.

Citizenship

- As good citizens, students understand to care for the environment.

Ann introduced the first lesson by showing an old photograph of a room before the advent of plastics and another showing some of the plastic items used in a modern home. She then asked the class to give examples of plastics they used in everyday life. As she listed their answers on the board, she used probing questions to elicit further uses, such as the use of synthetic fibres to make clothes.

Ann then asked the class to talk briefly in pairs to decide whether they thought the invention of plastics was a good thing. After a few minutes, she asked for comments from some of the pairs. While several students talked about how useful and convenient plastics are, a number of students mentioned the problems associated with disposal.

Ann then made a provocative statement. She said: "Maybe scientists should not have revealed their discovery until they had solved the problem of disposal." While the students realised that she was not wholly serious, this generated discussion about the role of scientists and whether scientists could be expected to take such decisions on their own.

Ann then wrote the first learning outcome on the board and, dividing the class into groups of four or five students, distributed the cards shown below.

1. Plastic furniture lasts a lot longer and is more hard-wearing than furniture made from natural materials such as wood or fabric.	2. Nylon ropes rot more slowly in seawater than ropes made from hemp (a natural fibre).	3. Nylon fibres are cheaper to produce than the natural alternative of silk fibres.
4. More tax should be collected to pay for more recycling facilities to help reduce waste.	5. If we burned plastics to provide energy when we have finished using them, we would not be producing as much pollution, as the amount of rubbish would decrease.	6. Kevlar (a plastic) is a better protective material than metal armour, as it is stronger.

7. Natural materials like wood and fabric are sustainable. We would do less harm to the environment if we stopped using plastics and used natural materials instead.	8. Polyester sweaters are easier to keep clean than woollen sweaters.	9. Some new plastics are biodegradeable. We should replace all plastics with the new biodegradeable ones.

She asked them to discuss the cards and to put each into one of the following categories:

- These questions can be answered by a single scientific investigation.

- These questions can be answered by a series of scientific investigations.

- These questions cannot be answered by a scientific investigation. They involve decisions that take into account social and political issues.

As the students discussed the cards, Ann went around the room listening to the discussion, and checking they understood the purpose of the task and the meaning of the statements. After about ten minutes, she asked each group to explain the decision they had made about one of the cards.

While there was some disagreement, most groups had placed cards 2, 6 and 8 in the first category. Although students had some difficulty explaining clearly and concisely why this was, Ann was able to use their answers to help them understand that these questions identified two materials that were to be tested and a single property that could be measured and compared.

Some groups also felt that cards 1 and 3 could be tested by a single experiment, but others pointed out that card 1 was quite vague. It wasn't specific about the materials that would be compared, the type of furniture or the treatment it would receive. Similarly, with card 3, while some costs such as the cost of fuel might be found scientifically, transport and labour costs would affect the answer. One student, Saida, said that that sounded more like Geography than Science!

Most groups had placed cards 5 and 7 in the second category. The group that talked about card 5 said that the question was complex and required data and observations taken from different places over a long period of time. Ann was very pleased with their answer and emphasised the point that complex scientific questions often needed a range of approaches and could not be answered by a single, simple experiment.

Most groups realised that although scientific knowledge could contribute to a decision on the statements on cards 4 and 9, the final decision was — to a large extent — a matter of opinion.

Ann spent the rest of the lesson showing a model plan for an investigation into whether nylon or rubber stretched the most before breaking. She showed this series of PowerPoint slides:

- Slide 1: Title of investigation and hypothesis

- Slide 2: Independent and dependent variables

- Slide 3: List of apparatus and materials

- Slides 4 and 5: Outline of procedure, including how other variables will be controlled.

Ann then asked the groups to choose one statement from cards 2, 6 or 8. She told them that they would be working in this group for two lessons to produce a presentation, following her model, showing a plan to investigate the question that arises from the card they had chosen.

Ann encouraged the students to work co-operatively and gave help to groups who found it difficult to get started. At the end of the second lesson, it was clear that they needed more time and she said they would have 15 minutes to complete the presentation in the third lesson.

Ann realised that there would not be time for all seven groups to give their presentation to the whole class. So, after 15 minutes of the third lesson, she selected one group to present to the whole class in five minutes. When they had finished, she allowed a short time for questions. She then paired the remaining six groups, allocating the members of the group that had already presented to different groups. She then gave each group five minutes to present to the group they had been paired with.

At the end of the three lessons, Ann evaluated what the students had done. She realised that she had spent three lessons on quite a small section of the scientific knowledge in the syllabus. However, she felt it was worthwhile in terms of increasing the students' understanding of how scientists work and providing them with opportunities to develop the student competencies.

COMMENTARY

This example was chosen because it demonstrates how well Ann prepared and carried out her teaching plan. She:

- was very clear about objectives;
- set out a clear structure of working;
- had plentiful opportunities for questions;
- used presentations as summary points;
- created time for students to work up their own ideas;
- through the group working, created the potential for each student to be actively engaged; and
- provided plenty of opportunities for co-operative working.

Activity 15: Planning and evaluating

You are now asked to plan, implement and evaluate a teaching sequence using a variety of teaching and learning methods and including at least one active, participatory approach for students. Do this working in your subject group or with a colleague.

Present the plan in the form of a chart that could be put on the wall and discussed with teachers of other subjects.

Once you have taught the sequence you planned, make a note of:

- the things that went well; and
- the things that you would change next time you taught the topic.

Question 8: How Can Teachers Use the Local Environment?

See Key Resource 9.

COMMENTARY

It cannot be stressed too strongly that learning needs to be an active process. It requires the learner to engage with ideas and in activities that stimulate thinking and develop understanding. Your role as a teacher is to provide situations that will encourage deeper learning.

One important way of creating a more active learning environment for students is to look beyond the classroom. The physical world around your school is a rich environment that can be used in many ways to support teaching in all areas of the curriculum. It can provide the stimulus for many topics. For example, if you were doing classification exercises in Science, you might start by looking at pictures of local animals or plants that would be familiar.

The local environment can provide both the context and content for your topic. If you are teaching about "place and space" to students, a mapping exercise around the school would help them realise how to represent buildings and roads on the map. If you wanted to look at environmental problems in the local community, such as litter or rubbish, you could use the students' knowledge of the local area to discover where such problems exist. On the human side, families can provide a highly interesting source of stories and histories.

Local people can be brought into your school to give talks or explain their jobs; these might be doctors or health workers, plumbers or computer experts. You will have to carefully manage introducing outsiders into the school, but this is a good way of establishing school and community links. Such experiences always fascinate students, particularly if the person is also a parent or relation of someone in the class.

Using the local environment is not something that you will do all the time, but something that you should consider frequently when doing your lesson planning.

ANOTHER TEACHER'S EXPERIENCE

Raghda was planning to teach a topic on mapping and using signs and symbols to her JSS 1 class. She told the students that, on their way to school the next day, they must try to observe six distinctive things on their route. She held a whole-class question and answer session on what she meant by distinctive things. For example, she talked about the difference between public buildings (such as a school) and private buildings (such as a factory). This led to a discussion of the distinction between public and private funding in the community.

The next day, the students listed the six things they saw, drew a picture of each thing and cut the pictures out. Raghda wrote out four labels that said "From the north," "From the east," "From the west," "From the south," and then placed each label in a corner of the classroom. She divided the class into groups according to the direction they take to school by asking the students to move to that corner of the classroom. She then asked each group to sort out all the objects they saw into the order they saw them, starting with the object furthest from school. There was much

discussion about the drawings and what they were, as well as deciding which pictures the students were going to use if they had more than one picture for the same object.

Raghda then pinned a large sheet of paper on the wall with the school marked in the middle and a north point on the sheet too. She explained that the different lines that she had drawn on the map represented the routes and directions the students come from. She asked two students from each group to come out and stick the pictures from their group in the correct order of their route to school. Raghda asked the students to look at all the objects listed on their "Routes to school by JSS 1" map and see if they could classify the objects into types (e.g. road signs, natural features such as trees, public buildings).

She made a list of all their suggestions and they discussed how these different types could be shown by symbols. The students agreed that the symbols should be simple and clear and represent the object as much as possible. They agreed a set of symbols to use, and Raghda drew these on the board to use in the next lesson.

Raghda planned to introduce a published map of the school area to the students in the next lesson. She would explore the similarities and differences between the students' own symbols and the standard symbols used on maps, before getting them to redraw their maps using the standard symbols to help them become more familiar with them.

COMMENTARY

By using the local area for this mapping exercise and using the students' own experience of coming to school, Raghda showed the students the relevance of maps and mapping symbols in helping any person find their way. This task also stimulated and interested the students because Raghda used something familiar to extend their thinking and help them move from concrete ideas to more abstract ideas.

Recent research suggests young children learn best by actually doing things and, as they play and do activities, they build up understanding that can help them learn more complex things as they grow and mature. As children learn new things, they need and benefit from the support of those who are more expert or competent than themselves, either their peers or a competent adult or teacher. Raghda was supporting and "scaffolding" — building up their understanding by moving them from the familiar to the less familiar and introducing new ideas at planned intervals. Using the local environment is a good strategy to engage students' attention and interest.

Encouraging students to ask questions and giving them choices about their work are both important when you are teaching them to be creative and to solve problems. By conducting their own research on a topic of their choice, they have ownership of the problem and will develop other skills alongside learning about the topic. The work they produce could even be of interest to future employers. Now read how one teacher, Mr. Saiti, encouraged students to investigate issues related to their own local environment; to choose an area of interest and research it in their own time and in their own way.

ANOTHER TEACHER'S EXPERIENCE

Mr Saiti was worried that some of the students in his Science class did not get a good balanced diet. Many had family plots at home for growing food, but these did not always yield a good harvest.

Mr Saiti decided to set his class a competition to research good techniques for growing crops on a small scale and improving the diet of the local community. He explained they should base their research on talking to people they know and other people in the community, and that he wanted them to use their scientific knowledge to explain the techniques that they hear about.

He divided the class into groups of four students. He asked each group to display their findings in a poster and told them that there would be a prize for the best plan. He put the judging criteria on the classroom wall so that the students could see what he would be looking for and plan their work accordingly.

The groups were very excited about starting the research project and tackled it in different ways. For example, Hari's group went down to the local market. They picked the stall with the nicest looking vegetables and chatted to the owner about how he grows them.

Sakina's aunt works in a local clinic. Sakina asked her aunt about the sorts of illnesses that local people have. As a group, they worked out what kinds of food would help improve local diets and reduce the likelihood of illness due to nutrient deficiencies.

Mr Saiti was delighted with how engaged the students were with the local research task. In addition, he noticed a small plot of land that belonged to the school, but which was not being used. He decided to ask the school principal if he could use this plot with his class to develop a small garden to grow vegetables and fruit.

COMMENTARY

You can see that there are many options available to you in exploiting the local environment. It also presents the opportunity for working with teachers from other subjects. For example, a common topic for secondary classes is the question of pollution and the problems caused by dumping rubbish in the marine environment. This would make a very interesting area of cross-curriculum, multi-subject enquiry.

Now try the next activity, which asks you to look at your own school environment and surroundings to think how you might begin to use them in your teaching.

Activity 16: Using your local environment as a teaching resource

Take a walk around your school at the end of the day and note down how you could use the local physical environment in your subject teaching in the coming month. For instance, you might want the students to be able to go out and collect objects, or draw or make a plan of the school grounds or local area. In Science, you could look at the way plants adapt to their environment. In language teaching, you could look at the way advertisements use language to sell goods.

Select an area of the curriculum in which you think you could use the local environment and make a plan of how you will use it for one or two lessons at the most. Also think about what you want the students to learn and which aspect(s) of the environment would be best to use for this. Think also how you will evaluate the students' learning.

What preparation do you need to do before you plan your lessons? You might have to identify what plants are found in the school grounds or maybe measure the buildings yourself so that you can guide the students if doing a scale plan.

Next, write your lesson plan so that you can see how long it will take and how to prepare the students. Think how you will manage taking them outside. Will you need to do it in small groups or go as a whole class? Will you need someone to help you? If so, who? What will the students do when they are outside? Do they need to record things and, if so, how will they do this? How will you use what they have done outside to assist their learning?

Next carry out the lesson and make a note of the plan and how well you thought it went.

When you have taught the lesson and evaluated it, find a colleague who has also done this activity. Share your experiences. Were all the students fully engaged? Did the lesson go to plan? How would you do it differently next time? Why? What did the students learn? How do you know this?

The local community as a rich resource

The local environment is, of course, also made up of the people within it, and these can provide a rich resource to use in your teaching. For example, as a teacher, one of your main roles is to help your students become fully literate in their mother tongue and other languages as appropriate, so they can access the full curriculum and achieve personal, social and economic progress in their life. This is a major responsibility in the primary grades, but as the curriculum becomes more specialised in secondary school, a range of teachers take on the task. Alongside the teaching of their particular subject, all teachers have a responsibility for students' language development. In secondary school, specialist mother tongue teachers have a particularly important role, and here the local community provides an important resource.

For example, in most communities there exists a range of stories, from fiction to historical tales, of the changes that have happened over time. Older people in particular may know stories that they were told as a child, but which are beginning to disappear from the local culture. These may be tales of ancestors or fictional folk tales that have survived through the ages. Students can be asked to try to find these stories. Your knowledge of the local community can help you identify people who could be invited in to tell their stories to the class. This might be an activity that extends over two or three weeks with someone invited in each week.

Students are likely to be highly motivated by this activity. They can use it to build their own stories in oral and written forms. At the end of the two or three weeks, you could organise a "presentation" of one or two stories by the class, perhaps to another class or even to the whole school. Children and young people love events like this! Such an approach serves

many purposes. Not only is it at the core of literacy, but it also helps promote cultural and community pride.

Now read John's story of how he asked a local storyteller to come in to class. This was the starting point for a range of drama activities that helped his students practise their language skills while thinking about the best way to act out a story or explore issues.

ANOTHER TEACHER'S EXPERIENCE

John teaches a Grade 8 English class. He arranged with his school principal to ask a local parent (known to be a good storyteller) to come and tell a story to his class.

The students really enjoyed the story and had a lot of questions for the storyteller. After thanking her, John asked his class to tell him the main parts of the story, which he listed on the board. Next, he divided the class into groups and asked them to think how they could act the whole story or any part of it they had particularly liked. He gave them 20 minutes to sort out their ideas and practise. He sent some of the class out into the playground so there was more room in the classroom for everyone to try out their ideas.

Next, he called the class together and then asked each group in turn to show what they had done so far. The students watched each group with great interest and applauded at the end. John was delighted with how well they had listened and was amazed with their performance and the interesting ways the groups acted out the same story. The students asked if they could do this again, as they liked both the storytelling and acting, and seemed to remember much more.

In the next lesson, John asked his class to think about the way drama could be used, not just to tell stories, but also to explore issues and problems that affected the local community or the wider world. He told them about an acting troupe in a nearby city that specialised in improvised drama about global issues such as pollution and climate change.

As the groups he had used for the previous acting task had worked well, John decided to use the same groups again. He explained that he wanted them to research a local or global issue of their choice and then present it as a short (5–10-minute) drama. They would have the rest of this lesson and the next lesson to research and plan, and then all the groups would present their short plays in the third lesson. John said that they could improvise their drama when they performed it if they chose, but suggested that in this case they still plan the structure of the drama and make sure they knew any particular vocabulary associated with the issue.

The groups chose a range of issues, both local and global, for their short plays and John was delighted with what they achieved. He felt that beginning the range of activities with the storyteller had inspired the students to be creative, and the language practice that resulted from the research, group work and performing the plays had been invaluable.

COMMENTARY

John's class were obviously interested and inspired when they had a visitor to their class from the local community and they enjoyed acting out the story she had told. The stimulus from outside motivated them to think more about how drama could be used, both to tell stories and explore global or local issues. The activities John planned not only motivated the students, but provided many opportunities to practise their language skills.

This shows how positive this way of working with students can be. In addition, developing students' empathy with their local area can have wider-reaching positive effects than just their education. They will begin to see the richness around them, which often goes unnoticed in the daily rush of going to school, doing chores and trying to feed families.

Question 8 has explored some ways you can exploit the resources of the environment and local community in your teaching. The accounts of other teachers' practice and the activities you have tried show how you can plan more stimulating lessons. These, of course, are only examples. Not all schools will have a storyteller able to come in to school, but there are many ways to use the environment and hopefully these ideas have inspired you to think about what might be possible in your context.

The outcomes from activity-based teaching of this sort are often displays and presentations. Students hugely enjoy making presentations about what they have done and learned. During the planning process and rehearsing, students have to think about the key facts they wish to talk about and how to make these clear to the audience. This discussion will deepen their own understanding and reinforce their learning. Organising presentations or displays can range from the very small scale, such as surveys or giving a talk to a group, to large-scale presentations to parents, which involve the whole school. The strategic skill of the teacher is in ensuring that such experiences are part of every student's school life.

Question 9: How Can Teachers Involve Parents/Carers in their Children's Learning?

COMMENTARY

As a teacher, you might well have your own children. If not, you are likely to have close relatives, a brother or sister perhaps, with children. You will know how the vast majority of parents watch their children's progress in school carefully.

The parents/carers of the students in your classes are likely to have the same level of concern as you, the teacher, that their children are progressing, but they do not have your knowledge or experience. Many parents are rather shy in talking to their child's teacher. Teachers have an important responsibility to ensure parents feel confident enough to talk about all aspects of school life. Where teachers have concerns about a child in their class, establishing a dialogue with parents/carers is one important part of addressing the problem. Look how one teacher dealt with such a concern.

ANOTHER TEACHER'S EXPERIENCE

Shakala was worried about one girl, Salma, as she was not progressing as well as expected. Shakala had never met any member of Salma's family, as she came to school by herself and her parents did not attend her first parents' meeting earlier in the year. This was a new event that the principal had introduced and took place at the end of the first six weeks of the new school year. It was a time for parents to hear how their child was progressing and find out how they could help their child with their work. Parents also had the opportunity to ask questions and seek support from the teacher. The principal organised for the teachers to be in subject areas, and parents from different years came at set times to see their child's subject teachers, in turn, for a few minutes at a time.

Shakala asked a colleague who had taught Salma's brother Mustapha whether he had the same problem seeing the parents. Together the teachers discussed the problem and remembered that they had met the parents at a school event last year. Both teachers remembered the parents appearing shy and reserved, and looking uncomfortable. After much discussion about what to do, it was agreed to extend a special invitation to the parents by inviting them in to take tea.

Salma's mother accepted the invitation and on the appointed day Shakala made sure that she said how well Salma was doing in her language lessons and in Art. Then she very sensitively explained how she felt that Salma was not doing as well as she could in all subjects, particularly in Mathematics and Science, and asked the mother if there were any problems that might affect Salma. She spoke about how, perhaps with a little help from both her parents and school, she could progress faster.

Salma's mother said that Salma had lots of chores to do at home and she did not think about homework for her, but she did make sure her son did his homework. Shakala suggested possible strategies, such as setting a time for Salma to do her chores and time for her homework, and then asked Salma to join them as they explored the best way forward. It was agreed that Salma would go home after school and do her chores before she sat down to do her homework. Salma usually

helped to make the meal too, but it was agreed that in future she would be excused this during school days and instead would wash the dishes after the meal. Salma would have a note of what homework she had to do that night and some suggestions of how her mother could help. Salma would tell Shakala if this plan was working; if not, they would work out another plan.

After the meeting, Shakala spoke to Salma's other teachers and particularly asked the Maths and Science teachers if they could give Salma some extra support. Shakala helped Salma in class and was careful about sending home the relevant information with her homework.

Over the next few weeks, Shakala saw a change in Salma's attitude to her work. She seemed more confident at tackling new work and, as a result, she was making better progress across the subjects, including in Science and Mathematics.

A few weeks later, when the school report was sent, Shakala received it back signed. Salma's mother had also written on it how much happier Salma was about going to school. Shakala was even more surprised and delighted when both of her parents came a few months later to attend a presentation written and organised by Salma's class. The first steps towards a real involvement had been made!

COMMENTARY

Shakala's first steps towards helping Salma were slow, but, with tactful discussion, a way forward was devised together. Shakala was lucky because Salma's mother had come into school when invited, but if she had not, what could Shakala have done to make face-to-face contact?

The next activity explores the steps you might take to develop a dialogue about achievement and progress with a student's parents/carers.

Activity 17: Involving parents/carers in the learning process

Think about the students you teach. Who is not progressing as well as they should, given what you know about them?

Based upon your records and observations, make a list of these students. For each student, list the areas that are causing you concern. Next, list possible ways to help them.

Now select one student and work through the rest of this activity, focusing on this student's particular needs.

Think about how the parents/carers might be able to help their child with their schoolwork.

Think about the kind of relationship and dialogue you have with this student's parents/carers, if any. Is it positive and constructive? If not, why not?

Reflect on what you could do to improve the dialogue. Talk with colleagues about possible strategies you could use. Plan what you will do first of all to improve the

situation. Will it be a phone call, a letter, a meeting in school or maybe a home visit? Most schools will have policies about contact between teachers and parents/carers. Make sure you work within this policy.

Think carefully about the purpose of any meeting with the parents/carers. If you are trying to help the student engage more with their learning and achieve more, be clear where you are going to start and what little steps you could take together. Try to be positive as you talk about progress and achievements. Think carefully about what you actually want to say to the parents/carers. Use language that they will understand and explain any terms they may not be familiar with. Explain carefully how you would like them to help and show them how to do this before you send tasks home. What other support could you offer to the parents/carers and the student?

Having planned carefully what you want to do, contact the parent/carer in the easiest way and agree a time and place to meet for the first time to discuss the student's achievements and ways forward.

COMMENTARY

Just sharing small successes about their children can change the perception of parents/carers towards school and improve overall communication with the family. The previous activity gives you the opportunity to tell parents/carers what their child can do well and then you can suggest how, with some support from them, their child can progress further and faster. Always emphasise how you would like to work with parents/carers in real partnership so that each of you is working towards the same end.

Developing good relationships with parents/carers is important, but helping them to understand the vital role that they have in their child's success at school is demanding and needs to be sensitively handled. Most parents/carers will have the same common aims as you, but perhaps do not realise what the impact of working together can have on their child's achievements. What you are trying to do is to help parents/carers:

- develop a good model of positive social and educational values related to personal fulfilment and good citizenship;
- develop their children's understanding of the importance of education and being a good citizen;
- develop their ability to question their child about what they did at school and follow up projects they are doing at school;
- celebrate their child's progress and achievements;
- understand the need not to threaten or punish their child if they are not doing well, and encourage their child, no matter how small and simple their achievement; and
- show interest in the child's learning and give time on a regular basis at home to assist their child with their homework.

The rewards for successful partnerships with parents/carers are profound. Students do better, families understand more and have a better relationship with the school, and schools that

actively involve parents/carers and the community will benefit from that support and tend to establish a better reputation in the community.

There are, of course, limitations to what you can do. As a secondary teacher you will be teaching many children. But even if you cannot follow something up yourself, make sure you communicate any concerns or worries to a class teacher, a head of year or the school principal.

Question 10: How Can Teachers Continue to Develop Professionally?

COMMENTARY

Congratulations! You have now completed 17 SBTD activities. In thinking about **Question 10**, we are setting out some activities that will develop your knowledge, understanding and skills with regard to:

- what it means to be professional;
- reflecting on your own professional development; and
- identifying your continuing professional developments goals.

People often say that someone is "very professional," or that they are "a hard-working professional." What do they mean by this? Many would say it implies a person who is organised, efficient, knowledgeable, and works well with other people. Defining professionalism is not easy, but we recognise it when we see it. For example, we recognise that a person, such as a nurse, bank clerk, teacher or doctor is acting professionally when they provide a service that enables their customer, student or patient to achieve an outcome that is most appropriate for them.

Sometimes, being professional is confused with being a member of a profession. Belonging to a profession means belonging to an occupation that requires specialist training with regard to an agreed body of knowledge and defined ways of working that inform the profession and give the profession its status and ethos. A code of conduct that regulates the way that people behave often controls such professions. Teaching is one such profession that usually has a code that details the duties of the teacher and the expected standards of behaviour it expects teachers to abide by. As members of the teaching profession, teachers accept these expectations and standards as core to their ways of working and behaving while working.

Simply having a code of conduct does not mean that all teachers will follow it or operate and behave professionally — although it is expected that they will. To be a teacher, you have to comply with the code and to be professional you have to work by the code to the best of your ability, acknowledging the importance of all the roles and responsibilities a job such as teaching demands of you. The code does not specify the detail of methods that a teacher should use, as these are dynamic and change according to the students' different needs, and as research informs practice about how children learn best.

But the code does highlight the teacher's responsibility to conduct themselves in a manner fitting to their post, to working professionally and to the best of their ability to meet the learning needs of the children and young people they teach. This means keeping up to date with current research and developing and extending their range of skills, strategies and understanding of the different ways of working to enhance the learning of all children and young people. This is the professional behaviour expected of teachers.

It is possible to identify five main areas of professional development namely:

1. personal and professional qualities (such as always wanting to do your best and reflect on your practice);

2. team-working qualities (such as listening to and sharing ideas with others);

3. professionalism in practice (such as always being prepared for lessons);

4. understanding children and young people as learners and supporting that learning (such as differentiating activities to help learners who are at different stages);

5. partnership with parents/carers (such as sharing successes and asking for help with their children's learning).

There needs to be an openness to change and a willingness to reflect on and evaluate your own practice. The next activity asks you to reflect briefly on what these areas mean to you.

Activity 18: Thinking about your own professional development

Think about each of the five main areas of professional development listed above and what each of them means to you. Which area or areas do you feel you have developed most over the last few weeks?

We suggest that this is a whole-staff activity. Work in pairs initially, brainstorming your responses regarding each of the five areas. Then each pair can share their thinking with everyone else. It will be interesting to see where there is unanimity around issues and where there are differences.

COMMENTARY

The development of professionalism is a dynamic process that changes as professional learning expands. The more you think about what you do as a teacher, the more you learn about yourself both as a teacher and as a person.

Of course, not all reflections result in change in practice or behaviour; they may, in fact, confirm that what you are already doing is right, effective and successful. As knowledge increases about the effectiveness of different ways of teaching, so will the need for teachers to reflect continually on their skills and knowledge about teaching and learning.

Now read about the way another teacher, Abdi, collected feedback on his teaching.

ANOTHER TEACHER'S EXPERIENCE

Abdi was in his seventh year of teaching and was participating in a school-based in-service course for teachers.

The course focused on different ways of working in the classroom to make teaching more interactive. Abdi was nearing the end of the course, which he had found really interesting and at times challenging, and now he wanted to ask one of his classes about their perceptions of the changes he had introduced.

He chose a JSS 1 class he taught, with whom he had tried out more of the strategies. He decided to use some simple questions for them to answer. He organised the students into groups, (each group made up of two pairs) with each group having a chosen scribe to write their agreed

responses down. They did not have to put names on the pieces of paper as Abdi felt that if he made the activity anonymous, the students would feel freer about giving their responses.

He then wrote the following questions on the board and asked each group to discuss their answers and write down a summary of the main points about the strategies that had been introduced.

- What new ways of working did you like most?

- Why did you like each of these?

- How do you think they helped you learn better?

- How could these ways of working be made even better?

- What ways of working did you not like as much? Why was this?

- What could be done to improve some of these ways of working that you do not like as much?

Abdi allowed about 20–30 minutes for this before collecting the responses. When he looked at their responses, he was pleased to see that most of the class felt that the new strategies that Abdi had introduced, such as working and talking in groups, had helped them think about topics more deeply. They also said through this approach they had learned from each other. However, some students said that at first they found the organisation of the groups confusing and that moving into groups was noisy and took too much time out of the lesson. They suggested it would be best to have a fixed group to work in as this helped them move more easily.

Abdi noted that working in pairs was also popular and the students reported how they liked working with different class members in the pairs. They felt they had made more friends in class because of this and they could help each other without feeling embarrassed.

One aspect the students were not so happy about was when they were asked to give feedback to the whole class on their discussions. Some were nervous that they had to speak in front of the class and worried that others might not like their feedback. Abdi thought about this and realised that maybe he had not given enough help in reporting back to the whole class, especially in the early stages. He had also not considered that some students would find it harder than others. He thought he could help in the future by giving more direction to the groups as they worked, and also support each reporter more by asking relevant questions to help them structure their feedback and also be more encouraging.

Abdi found the students' insights really helpful and he made sure he noted them down to help him develop his practice more. He also felt that they raised issues for him and he needed to really think about the strategies that he had tried to develop, such as asking questions. He remembered that he had seen an article about asking open-ended questions in a science methodology book in the library and decided he would take it home to read. Abdi also thought he would discuss his concerns with his colleague Akin, who had often talked about the importance of questions in helping to support thinking. Akin worked in a teacher-training college and Abdi felt he could help him greatly. He resolved to contact Akin at the end of the week to arrange a meeting.

COMMENTARY

Undertaking an activity such as Abdi did with your class may make you feel apprehensive, but if you set up the activity carefully you may be pleasantly surprised at how helpful students can be. However, there are also other ways to gather feedback that are more informal and will still help you to reflect on what happened. For example, just asking at the end of a lesson if the students enjoyed it, and what they liked doing most and least, will give you some idea of their involvement and learning and what it suggests about your planning.

Activity 19: Planning for personal professional development

This activity is in three parts:

First, as an individual, we want you to think about what you have gained most from the recent weeks of SBTD. For your own record, write down the areas in which you feel you have developed the most.

Second, working in pairs and then sharing as a staff, discuss which things over the past few weeks were particularly beneficial to the teaching staff as a whole.

Third, for your next phase of school-based activity, what are the areas of professional development you think need to be focused on? List these as a beginning to deciding how the next phase will be organised.

Activity 20: Reading and researching for professional development

This is the final activity. A good teacher keeps up to date with ideas about the content of the subjects they teach and the way they are taught. Access to online information allows this process to happen in a much simpler and cheaper way than in pre-Internet days. This activity does require Internet access.

Identify two or three websites that you feel you will be accessing regularly to further your own professional development. Do this individually or in pairs and then share your ideas with the other teachers in the school. You could then prepare a "school list" of sites and take it in turns (on a termly basis maybe) to keep the list updated.

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COMMONWEALTH of LEARNING (COL)

4710 Kingsway, Suite 2500
Burnaby, BC V5H 4M2 Canada
Phone + 1 604 775 8200 / Fax + 1 604 775 8210
info@col.org
www.col.org
@col4d
facebook.com/COL4D/
instagram.com/commonwealthoflearning/

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