

Practical learning in a connected curriculum: blending knowledge and skills through the International Baccalaureate Middle Years Programme (IB MYP)

Oakham School, Rutland



www.oakham.rutland.sch.uk

Compiled with the help of:

Dr Leo Dudin, Deputy Head Academic

Tim Weston, Head of Design and Technology

Dmitriy Ashton, Coordinator of the International Baccalaureate Middle Years Programme

Dr John Chilton, Head of Physics

Pupils in Years 8, 10, and 11



Headlines

- FOSIL (Framework of Skills for Inquiry Learning)
- Interdisciplinary learning
- Student teamwork and leadership



About the school

Oakham School is an independent co-educational boarding and day school for 10–18 year olds, located in Rutland in the East Midlands.



Making learning whole

Oakham School (Oakham) aims 'to teach our pupils knowledge, skills and values to thrive and confidently contribute at Oakham School and beyond'. To achieve this aim, the School has been offering the IB Diploma Programme alongside A levels since 2001. It has recently implemented the IB MYP for pupils aged 11 to 13. The headmaster, Henry Price, says:

'When I think about the way curriculum and education is evolving, I don't believe in an old-fashioned debate between knowledge and skills. I think knowledge and skills both have to be at the heart of education, and I think the MYP gives us that framework.'¹²

Henry Price

Oakham's teachers stress the importance of helping pupils achieve success throughout the school years and preparing them for life beyond school. They take a long-term view of the skills that pupils will need to thrive when they arrive in the workplace. Skills for the future, emphasised by organisations such

as the World Economic Forum, are developed through the IB MYP:

'Right at the heart of the MYP is this idea of building skills into what we learn in class and outside of class and this falls into five key areas... and those five areas are explored in all sorts of different ways through the Middle Years Programme.'¹³

Leo Dudin



Embedding practical learning in the curriculum

Oakham pupils study the MYP for three years in Years 7–9 (age 11–13) before moving on to their GCSEs in Years 10–11 (age 14–15), followed at 16+ by higher level programmes including the IB Diploma Programme, A levels and other qualifications.

One of Oakham's core values is Connection. The MYP encourages pupils to make practical connections between their studies and the outside world that is greatly aided by the development and application of practical skills.

The MYP does not separate skills from knowledge. These are linked together, so for each unit of work delivered across the school, teachers identify knowledge and the skills that are taught explicitly in the classroom. In that way, practical subjects can achieve greater parity with knowledge-based subjects through the MYP curriculum.

'We don't have a situation where knowledge overpowers everything, but at the same time, we don't have a situation with the practical side of things impacting knowledge, so it creates a balance.'

Dmitriy Ashton

The skills are defined in the MYP skills framework called Approaches to Learning (ATL)⁴ and provide a unifying thread throughout the subjects. ATL includes five skill sets necessary for independent learning: social skills, thinking skills, research skills, communication skills and self-management skills.

Teachers plan which skills they are addressing in their lessons. Pupils' progress is tracked through the programme as they move through four levels of skills competence: novice, learner, practitioner and expert.

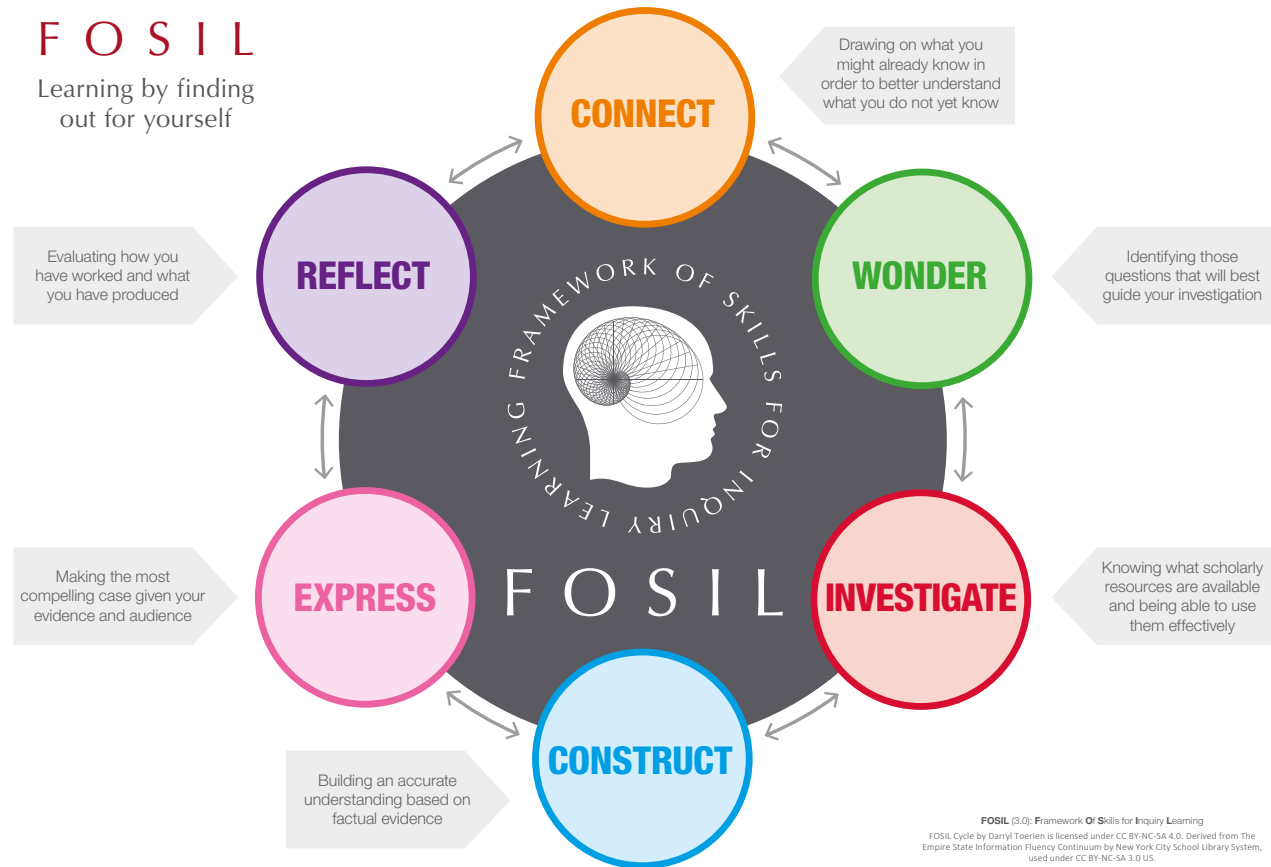
The MYP ATL is used concurrently with the internationally acclaimed framework for inquiry-based learning known as FOSIL (Framework of Skills for Inquiry Learning)⁵ that has also been developed by Oakham. The research skills within FOSIL and the ATL framework have been mapped to each other.

The combination of the ATL and FOSIL frameworks supports Oakham teachers in developing pupils' skills.

'We all speak the same language in the School when we approach inquiry with pupils, and pupils

F O S I L

Learning by finding out for yourself



FOSIL (3.0): Framework of Skills for Inquiry Learning
FOSIL Cycle by Darryl Toerien is licensed under CC BY-NC-SA 4.0. Derived from The Empire State Information Fluency Continuum by New York City School Library System, used under CC BY-NC-SA 3.0 US.

are familiar with the process.'

Dmitriy Ashton

This consistent reference to the skills by teachers ensures that pupils build up the habit of using the FOSIL structure:

'The teachers are very big on saying, "Right, today we're going to research"; it does add a lot of structure, but then I think that they want you to, as you go through the School, just do it without having to be told, like, oh

today we're reflecting, and just do it yourself.' Year 8 pupil

The value of this approach becomes clearer by the time pupils put their portfolios together for internal scholarships at 13+ or 16+ for design and technology (D&T) and art:

'For the scholarships we had to put together a portfolio of all our projects, so that's reflecting, looking back. What have I done? What's good? What could I have done better? No matter how long

you spend on it, there is always something you could have done better.' Year 11 pupil



Learning for the real world

Teachers of computer science and D&T – which are combined in the IB MYP Design subject group – use the MYP holistic structure to teach through contextualised learning tasks. Teaching in a relevant context is important in the MYP. Pupils

explore how the knowledge they are learning applies outside the classroom. To do that, they need knowledge and skills which are valuable beyond the specific task.

‘For the world we live in, very often you need different bits of knowledge to solve the problem, and we no longer have problems that require just one particular bit of knowledge.’ Dmitriy Ashton

Pupils use the design cycle in computer science lessons to lead them through four stages of inquiry: exploring the problem and identifying possible solutions, planning, develop ideas, then the practical stage where they create something and finally. After this, they reflect on the process and outcome.

‘Last year they were creating a digital toy out of a microcomputer called BBC micro:bit... and the pupils went through all four stages, so they explored a computer game. They designed the game, then they programmed it and reflected on the success of their solution.’
Dmitriy Ashton

In D&T, during GCSE years, Tim Weston, Head of Design and Technology, says that pupils’ manufacturing projects might look like traditional activities. They make items such as tea light holders and lamps, but before they reach that stage, the iterative modelling that pupils have gone through, making card models and using a wide variety of digital tools, will have

helped them learn a wide range of practical skills. These could be using hands-on, IT-based, drawing and sketching techniques or problem-solving skills.

Pupils appreciate how combining theory and practical learning contributes to their finished product.

‘When you are figuring out what to do next with the product, you’ve got something in your head, and you know how you want it to look, but then you need to figure out how you put it together with different tools and materials, to know how everything works.’
Year 10 pupil

This iterative way of working enhances pupils’ understanding of theory and leads to success in exams. It also fosters resilience, a willingness to learn from mistakes and a desire to improve their work.

‘If you make mistakes, you can learn from them, rather than just saying, this happens and that’s bad, you actually do it yourself and then you remember it.’
Year 11 pupil

The combination of developing practical skills and understanding the context in which they are used gives pupils confidence. They would know how to act when going into a job, rather than just knowing the theory. This helps them decide which career they might choose.

‘When I’m older, I’d rather have a hands-on job like a doctor or similar. You’re meeting people, talking to people, and helping them... so starting with this practical learning early on gives us skills for the future.’

Year 10 pupil

More exciting interdisciplinary learning is taking place as collaboration between departments increases. One unit, taking place in Year 9 through collaboration between Design and Technology, History and Biology, has seen pupils learning about blood loss and injuries sustained during events of the First World War and incorporated the WW1 battlefields visit. Back in school, pupils were challenged to design products to evacuate wounded soldiers safely from the battlefield. This included a new adaptable leg splint and products that would have better enabled soldiers to survive the trenches, such as kit to keep medical officers’ supplies dry, or products to improve soldiers’ sleep. The pupils also met amputee veterans and finished the unit by making a ‘Dragons’ Den’ style presentation, imagining they have been selected to present their idea to the MoD⁶.

Beyond the MYP and GCSE, in A level Physics, practical learning is fundamental to the subject. It not only helps learning Physics but also develops pupils’ critical thinking skills that stretch across all subjects.

‘I think practical skills, more than the theory, have got valuable lessons on scepticism, on the scientific method, and important skills for life, which even if you’re not a scientist, you should generate.’ John Chilton

Dr Chilton also uses practical work to create ‘memorable moments’ for pupils.

‘Part of my role as a teacher is to try and create moments for the pupils, moments that will stick in their memory, moments that will potentially be important to them in their life, purely because they will remember great moments at school and great pupils that they worked with.’ John Chilton

Pupils do find science practicals engaging and memorable when their attention is held during those learning moments.

‘I think it holds my attention a lot more, you can’t really go off daydreaming, you have to be on it.’ Year 8 pupil

Or when a longer-term memory is created to draw on when preparing for exams.

‘When you’re doing a practical, you really remember that lesson. Then, in the exam, you can remember back to when someone said this, when we did that, or this happened, and it’s a lot easier to recall memories like that than it is to recall what you wrote on a page.’ Year 11 pupil

Practical learning offers more than just memory recall. Pupils believe that doing hands-on learning creates a personal meaning for them.

'You feel more included, because when a teacher does it, you're just watching, you're not really taking it in as much. When you're feeling the tools that you need to use to be able to do the experiment, and you can also interpret it in your own words, you can remember it more, instead of a plan that your teacher has prepared or what's in your book.'

Year 10 pupil

Nevertheless, they recognise the need for a balanced learning experience.

'There is enough practical for you to still be engaged in the lessons, but, obviously, there is a lot you need to learn outside of practicals.' Year 11 pupil

Using a full range of teaching methods

The provision of the five MYP skills areas is rigorously tracked through the curriculum. Teachers regularly share their teaching schemes to plan which skills are developed through their own units. This helps Dmitriy Ashton, who maintains a spreadsheet to identify each skill taught in different subjects and levels, to see if any skills need to be increased or decreased to maintain a balanced input for pupils.

In recognition of the value of these five skills areas, Oakham teachers are exploring the possibility of extending their use beyond the MYP years to further enhance the connected curriculum during pupils' final two years at the School.

Cultivating learner agency

Oakham teachers encourage pupils to follow their own interests where appropriate and push themselves to reach their full potential. They find that, through this co-creation of learning opportunities, they learn themselves.

'If a pupil says, "I want to try this" and we don't know how to do that process, we don't say no. I think the important thing is we actually say, "Well, we don't know, but let's see if we can find a way of doing that." They're not the only ones learning; we're also learning new processes as well.'

Tim Weston

Pupils develop a desire to constantly improve their work, which is encouraged through the sense of ownership that practical learning gives them. This is not necessarily generated when learning in the traditional classroom.

'You want to produce some good work, but if you're just listening to your teacher read or something, it's a lot less engaging.' Year 8 pupil

Practical learning also supports pupils' mental wellbeing, it calms

them down and fosters their pride in their achievements.

'It just makes my week a lot more enjoyable, a lot less stressful and it calms everything down a bit.'

Year 10 pupil

'To get the reaction to work in science is very satisfying, you feel very proud of yourself.'

Year 8 pupil

Practical learning helps pupils connect with each other.

'I definitely think that there's more respect for other people's ideas and more connection with people, when you do things practically. In DT, if someone helps you through a demonstration and then you do it, there is definitely more of a connection with that person.'

Year 11 pupil

Oakham teachers also recognise the emotional aspects of memorable practical learning experiences.

'There's just a wealth of emotion associated with those moments when they happen, but they will remember those.' John Chilton

Pupils learn communication skills, how to share ideas, to present their own opinions and listen to other people. Whether they are presenting their ideas on Romeo and Juliet or talking about a factual topic in geography:

'Basically, your peers educate you and you educate your peers'

through your presentation.'

Year 10 pupil

Teamwork and leadership are fostered through pupils working in pairs in science practicals:

'Team working is a big deal because they typically are not great at team working. So every opportunity for them to do that is, I think, a good opportunity.'

John Chilton

The resilience and ingenuity of Oakham pupils during the periods of COVID-19 lockdown were evident. One enterprising D&T pupil designed and marketed a standing desk and donated the proceeds to charity⁷.

Oakham is well-resourced with excellent facilities, workshops and studios⁸, which attract pupils to the School. Pupils find that spaces where practical learning takes place can take on a particular importance for their personal learning, for example in a D&T workshop where a project was completed.

'It's kind of your space, I'll come in to DT and I'll sit there to work on my project. It's my time, my space, focused on my project. Whereas in the classroom, it's not really, it's everyone's shared space.' Year 11 pupil

Tracking learner progression

Through reference to the MYP ATL, teachers can be sure that every pupil has had the opportunity to

develop skills as well as knowledge. Progression wall-charts in classrooms remind pupils and teachers of the skills.

‘Pupils have frequent opportunities to reflect on the development of their skills and would themselves comment and say how comfortable they feel with the development of a certain skill.’ Dmitriy Ashton

Assessment criteria are often linked to context, as well as to knowledge and skills. So, for example, in the computer science task example described earlier, creating a game for 4- to 6-year-olds involved pupils researching the market as well as creating the game. A game that evidenced high levels of computational skills but was not actually worth creating would not attract as high a mark as one that proposed a novel solution to the problem that was also engaging for the target audience. A similar differentiation in design and technology pupils’ abilities can also be made between those who have developed higher order skills such as analysis and synthesis, where:

‘Those pupils that generally do well are the ones that are able to create links between different topics and contexts... Our subject is not one where you learn for rote. DT focuses on applying knowledge and skills to a wide range of problems’

Tim Weston

Periods of online learning over the past two years have fostered a creative use of learning technology, for example with apps and digital tools that have supported both pupil learning and staff collaboration. Pupils engage in peer assessment to encourage them to learn from each other and to gain digital credentials when they complete teacher-designed tests online using CertiFile.

External recognition for Oakham pupils’ achievements is widespread.

‘The School has achieved 23 Arkwright scholars in the last 18 years. We have also won 20 national and regional awards including Young Engineers for Britain, Big Bang, MTA TDI and IKB.’ Tim Weston

Pupils work on enrichment projects with local companies such as Mecc Alte and CBS to solve real-world engineering problems, that often leads to awards and recognition. Recent awards include ‘Best Teamworking’ prize for six Year 12 pupils in recognition of their work in the Industrial Cadets Gold Engineering for the East Midlands in May 2022⁹.

Finally, teachers recognise the value of practical learning in supporting whole learning at Oakham because it enables all pupils to thrive.

‘We’ve realised over time that this is the best way of developing those skills, as well as differentiating between different abilities, and how pupils can actually reach their potential.’

Tim Weston



Endnotes

1. www.oakham.rutland.sch.uk/about-oakham/purpose-and-values
2. www.oakham.rutland.sch.uk/academic/ibmyp
3. www.oakham.rutland.sch.uk/academic/ibmyp
4. www.ibo.org/programmes/middle-years-programme/curriculum
5. <https://fossil.org.uk/fossil-cycle>
6. www.oakham.rutland.sch.uk/news/form-3-pupils-enjoy-cross-curricular-ibmyp-design-and-history-day
7. www.oakham.rutland.sch.uk/news/entrepreneurial-dt-pupil-designs-a-standing-desk-for-charity
8. www.oakham.rutland.sch.uk/academic/subjects
9. www.oakham.rutland.sch.uk/news/oakham-engineers-awarded-the-best-teamworking-prize-for-their-work-in-the-industrial-cadets-gold-scheme