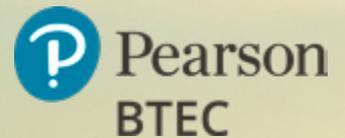


BTEC Tech Award in

Engineering

Your Key Stage 4 BTEC for schools



The skills to succeed - the confidence to progress



What's inside your first look guide?

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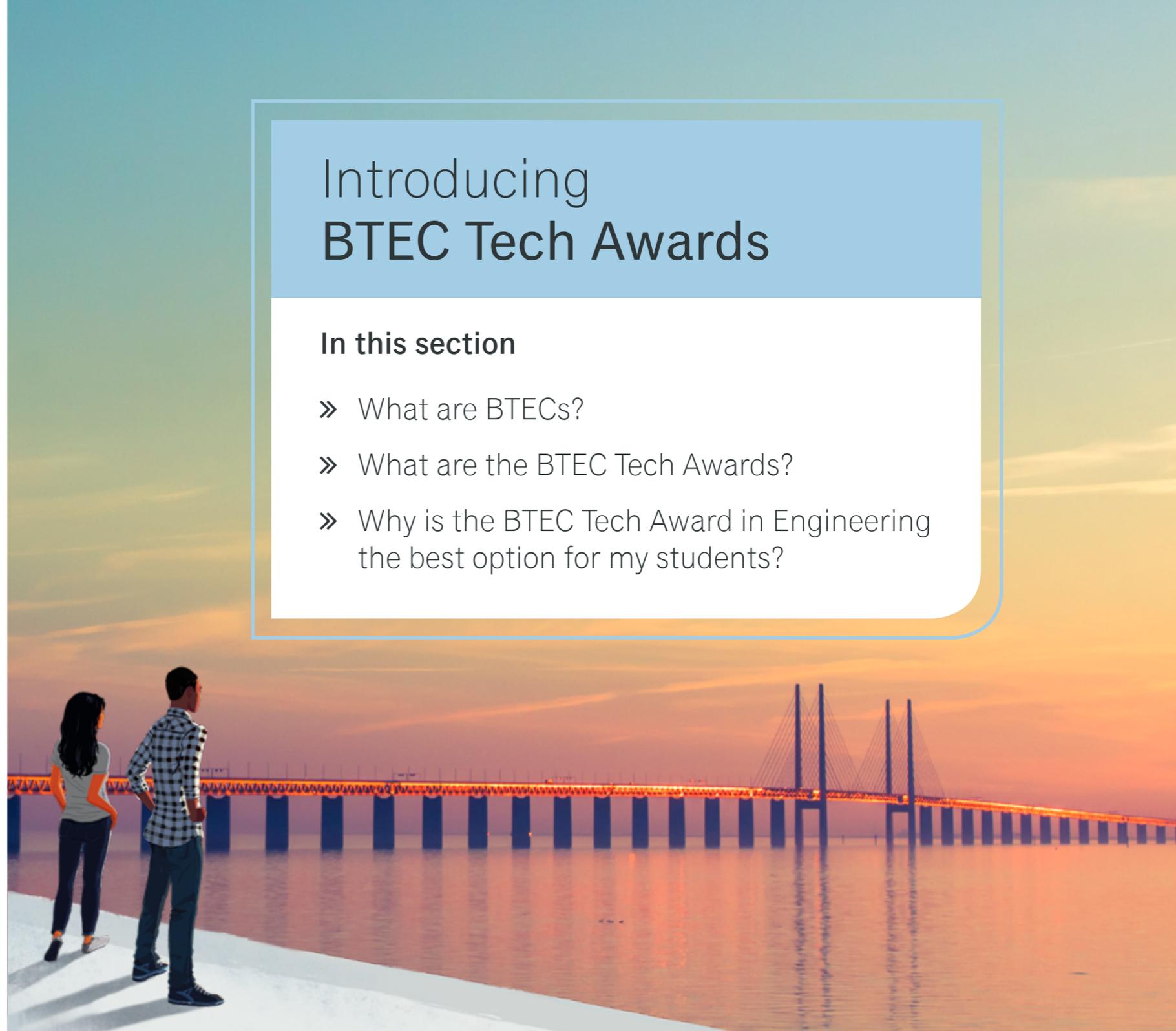
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Introducing BTEC Tech Awards

In this section

- » What are BTECs?
- » What are the BTEC Tech Awards?
- » Why is the BTEC Tech Award in Engineering the best option for my students?



New to BTEC at Key Stage 4?

What are BTECs?

Chosen by **over a million students** every year, BTECs are vocational qualifications designed to help your students succeed. Students develop knowledge and understanding through **applying their learning to work-related contexts**, and gain the **skills they need** for further study and employment.

What are BTEC Tech Awards?

Designed **specifically for schools**, BTEC Tech Awards are brand new Level 1 and Level 2 qualifications for first teaching in September 2017. Complementing GCSEs and providing a first glimpse into a professional sector, these qualifications assess students through **assignments and tasks rather than traditional exams**.

BTEC Tech Awards have been specifically designed:



for 14-16 year olds in schools



to give students a hands-on taste of the sector, and the skills and confidence to take their next steps



to count in the 'open group' of Progress 8.

Why choose BTEC Tech Award in Engineering?

- Teach the course as an introduction to Engineering, or focus on specialist areas: **the choice is yours.**
- **Clear progression** to the Level 3 National.
- **All the support you need:** free course materials, published resources, and a subject specialist always on hand.
- Assessments based on **real-life scenarios** your students will recognise.
- **Graded across Level 1 and 2** to ensure all student achievements are recognised.
- Prepares students for the world of work by developing **transferable skills.**

Read on to find out more

Teaching BTEC Tech Awards

In this section...

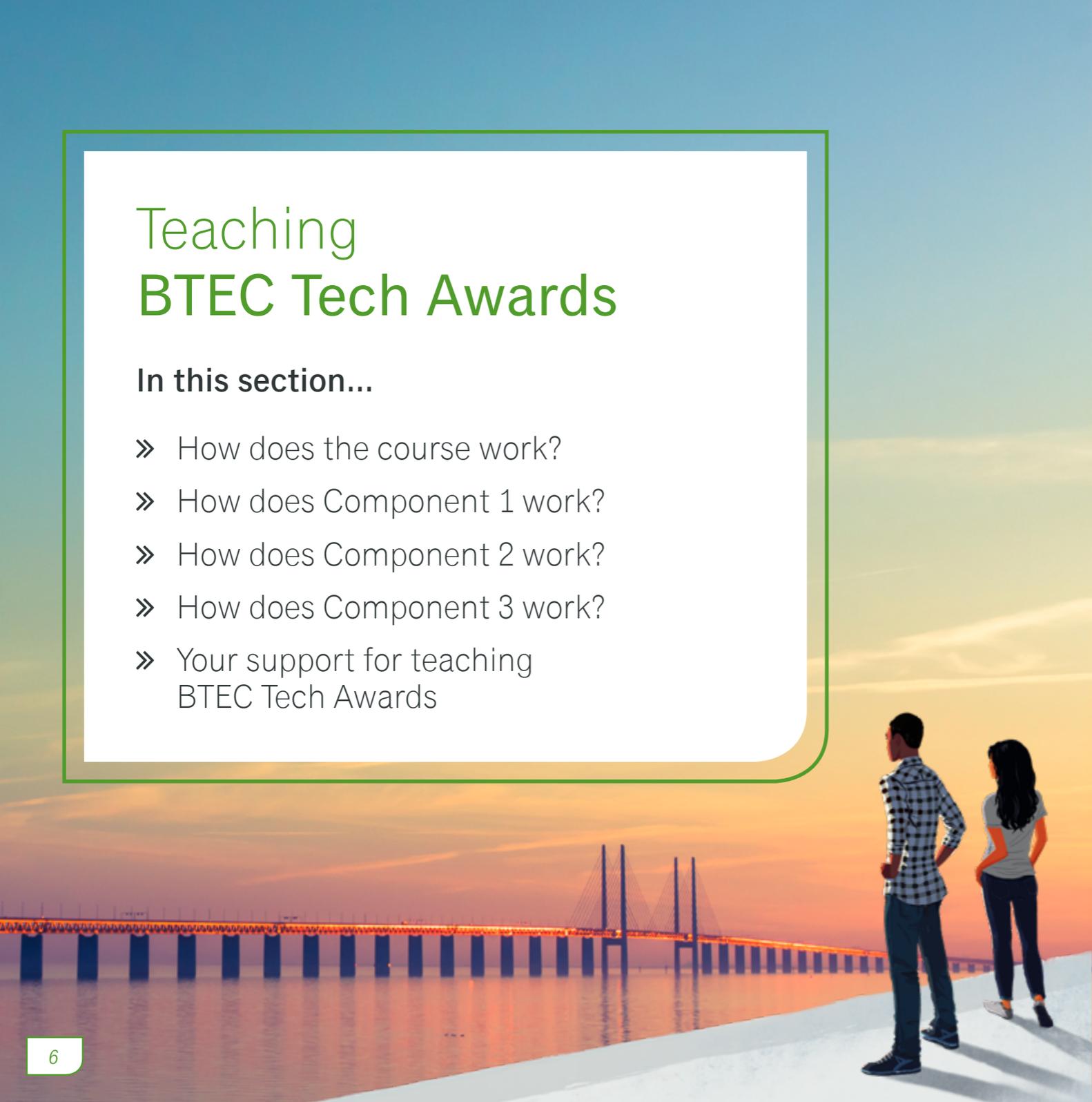
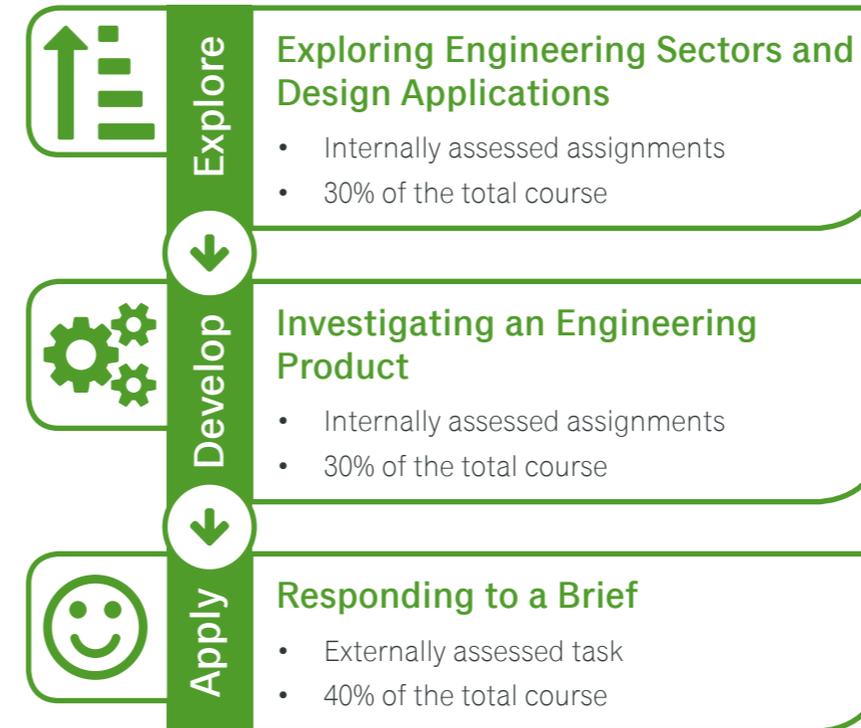
- » How does the course work?
- » How does Component 1 work?
- » How does Component 2 work?
- » How does Component 3 work?
- » Your support for teaching BTEC Tech Awards

How does the course work?

The course is made up of **three components**: two that are internally assessed and one that's externally assessed.

Our three-block structure, **explore, develop and apply**, has been developed to allow students to build on and embed their knowledge. This allows them to grow in confidence and then put into practice what they have learned.

Our assessment structure is also designed so that students can build on what they learn, and develop their skills, as they move through the course.



Component 1: Explore

Students explore the various engineering sectors, and the role of design in engineering

Explore



Component 1

Exploring Engineering Sectors and Design Applications

Aim: get to know industry sectors and how they work together to solve real-life problems.

Assessment: internally assessed assignments

Weighting: 30% of total course

During Component 1, your students will:

- **explore** the different sectors, products and interconnections within the industry
- **investigate** what various engineering organisations and functions do, in addition to potential career paths
- **discover** the engineering design and manufacture processes.



For more information on the content in this component and assessment examples visit: quals.pearson.com/TAengineering and explore Section 3 of the specification.

Component 2: Develop

Students develop knowledge and understanding of the processes of engineering a product

This component can be tailored to your students: simply choose a product that fits their interests.

Develop



Component 2

Investigating an Engineering Product

Aim: explore the types of materials, components and processes used to make products, then reproduce and test a product.

Assessment: internally assessed assignments

Weighting: 30% of total course

During Component 2, your students will:

- learn why engineers choose certain materials and components to make products
- investigate how products are made
- identify best practice when it comes to safety and risk management
- develop research, observation, recording, interpretation and measuring skills
- put what they've learned into practice by safely planning, reproducing and testing an engineered product.



For more information on the content in this component and assessment examples visit: quals.pearson.com/TAengineering and explore Section 3 of the specification.

Component 3: Apply

Students pull together all they have learned and apply their knowledge by creating their own product

This component can be tailored to your students: simply choose a product that fits their interests.

Apply



Component 3

Responding to an Engineering Brief

Aim: provide solutions to real-life problems by creating their own engineered product.

Assessment: externally assessed task, where students create an engineered product based on a brief.

Weighting: 40% of total course

To achieve this aim, your students will:

- build on what they've learned in Components 1 and 2
- identify the problem, develop a hypothesis and investigate possible solutions
- create a prototype that meets the brief
- record, analyse and evaluate data and outcomes, and reflect on how the product meets the brief.



For more information on the content in this component and assessment examples visit: quals.pearson.com/TAengineering and explore Section 3 of the specification.

Your support for teaching: **overview**

Free support

Course materials

There are lots of materials available on our website to support your planning and delivery, including:

- Course Planners for 1 and 2 years
- Schemes of Work for each component
- Assessment materials: SAMs, Authorised Assignment Briefs, and Sample Marked Learner Work.

quals.pearson.com/TAengineering

Training events

We will be running Getting Ready to Teach events to help you feel confident teaching and assessing this new qualification.

quals.pearson.com/training

Engineering Subject Advisor

Your Engineering Subject Advisor, Evren Alibaba, is always on hand if you have any queries. Get in touch at:

✉ TeachingEngineering@pearson.com ☎ 020 7010 2170

Published resources

Every lesson made simple



Step 1:

Scheme of Work

Every lesson covered

Our resources are built around the free Schemes of Work and cover every lesson from all three components, to make planning and teaching simple.



Step 2:

Student Book

Every lesson in one spread

Each lesson in the Scheme of Work has a corresponding two-page spread in the Student Book, with all the content you need to teach that lesson, as well as activities, case studies and assessment practice. *See pages 16-17.*



Step 3:

Teaching Resources

More resources for every lesson

The online Teaching Resources offer additional front-of-class resources matched to each lesson in the Scheme of Work, including PowerPoints and worksheets. *See pages 18-19.*

Order your free Evaluation Pack at:
www.pearsonschools.co.uk/engtechres

Your published support for teaching: Student Book

Each two-page spread within this Student Book covers a one hour lesson from the free scheme of work.

A warm-up task, to get students thinking and engaging with the topic.

GETTING STARTED

Why are engineers needed? With a partner, discuss why you think engineers are required and where they work. How many types of engineer do you think there are?

The need for engineers

Engineering provides employment to many millions of people across the world, allowing a range of products to be designed, made, transported, operated and serviced.

However, the technological progress will not stand still with time, and engineering industries are constantly evolving, with new products being developed, requiring new skills and processes. Engineers of one discipline are now encouraged to be involved with new types of technology and the engineering principles that go with them.

Types of engineer

As you may expect, with there being many engineering disciplines and subdisciplines, there are many types of engineer who work in the associated industries. The list of types of engineer is extensive.

Each type of engineer will undertake training and education in their respective field of engineering so that they learn and understand the scientific principles and methods of working needed for them to undertake engineering tasks and use their skills to solve real-world problems.

ACTIVITY

Search online and see how many types of engineer you can find. Is the number more than you originally thought?
Do you know any engineers – family members, friends? What do they do?

KEY TERM

Interconnection is the close connection between or the joining of two or more things.

Engineering interconnections

More and more, engineers in one engineering discipline need to be able to work in another. The development of many of today's engineered products means that there are now many **interconnections** required between engineering disciplines for them to operate efficiently.

For example, within the automotive or car manufacturing industry, this includes:

- **Mechanical engineers** who make various car parts using machine tools.
- **Electrical engineers** who design and maintain factory electrical switchgear, including transformers to convert 11 kV supply voltage to 440 volts so the factory machines can work.
- **Electronics engineers** who design the engine management systems that control a car's engine functionality.
- **Computer engineers** who support all other disciplines, looking after computer hardware and writing the many software programs, such as those used to control production processes and purchasing stock levels.
- **Maintenance engineers** who maintain and service machines and repair equipment breakdowns.

EXPLORING ENGINEERING SECTORS AND DESIGN APPLICATIONS

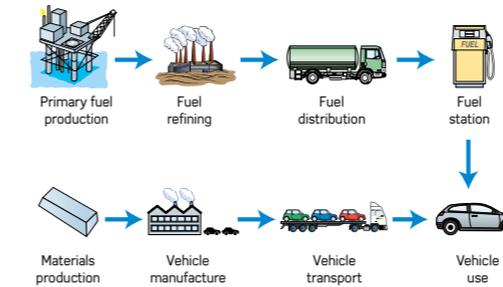


Figure 1.1: Linking the different processes for the manufacture of fuel and a motor vehicle

ACTIVITY

In a small group, think of as many interconnections between the types of engineers and the engineering disciplines and subdisciplines, and create a diagram to show the interconnections.
Present your diagram to the whole group and discuss.

Why are more engineers needed?

Over time, the UK and many other countries have not trained enough engineers. It is currently estimated that there is a shortage of 80,000 engineers in the UK.

There is also a European shortage of skilled technicians and professional engineers. Olof Persson, the chief executive of the Volvo Group, said in the subject in 2013 that 'by 2025, we (Europe) might need 500,000 engineers.' In comparison, India and China are currently educating 500,000 engineers annually.

In today's engineering world, the issue of personnel who are not multi-skilled, meaning they cannot do more than one job within engineering, is of even greater significance to employers. There is an ever-increasing need for people with expertise in more than one engineering discipline, who can then cross over between engineering industry boundaries. For example, an electrical engineer who can support and solve electronics engineering problems is of great benefit to an engineering company.

CHECK MY LEARNING

There are many types of engineer, many specialising in one engineering discipline. But there is a significant need for more engineers, especially those with the training and skills to cover more than one discipline.

Look online and see how many job advertisements for engineering apprentices you can find, both where you are based and across the UK. How many mention cross-discipline training?

This is the main lesson activity, which is designed to build students' understanding of the topics and how they will be assessed.

DID YOU KNOW?

Volvo are the world's second-biggest truck maker in the world.

This is the lesson plenary, helping learners to reflect back on the lesson objectives – could be used for class discussion or homework.

Contains a handy definition of key words, phrases or concepts – useful for revision.

Order your free Evaluation Pack at:
www.pearsonschools.co.uk/engtechres

Your published support for teaching: Teaching Resources (via ActiveLearn Digital Service)

Our Teaching Resources provide extra activities for each lesson in the Scheme of Work, and are designed to complement the Student Book spread.

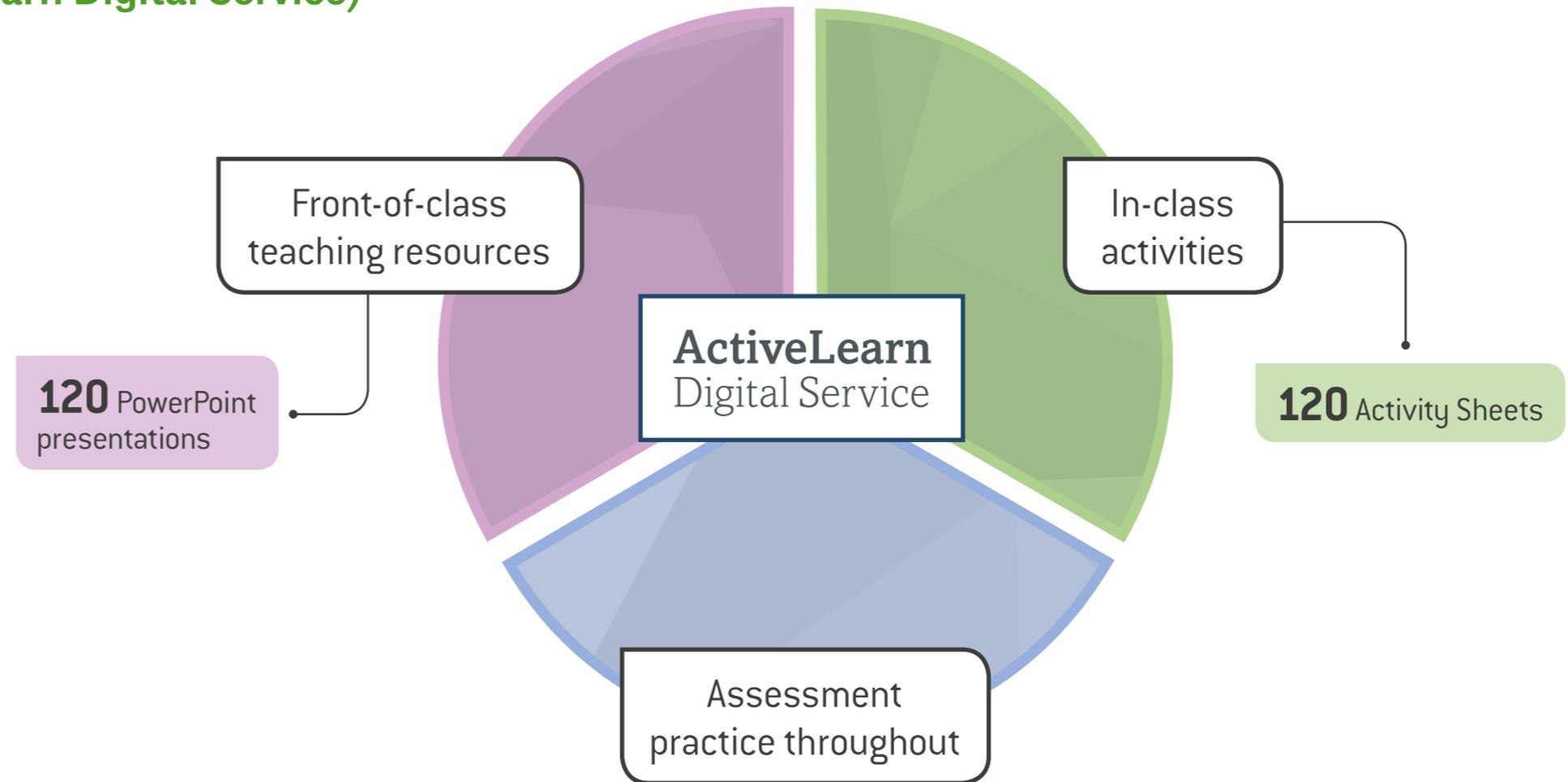
What's inside?

- Online version of the Student Book for front-of-class use.
- Ready-made PowerPoint presentations.
- Activity and assessment worksheets, that you can download and tailor to your students' needs.
- Video clips and interviews to provide an insight into the sector.

How will it support my teaching?

The Teaching Resources build on the lesson spreads in the Student Book, providing you with additional front-of-class teaching resources for every lesson.

Using the Student Book and Teaching Resources together means that you have all the lesson content and teaching resources you need to plan and teach every lesson from the Scheme of Work.



Download your free slice of teaching content at:
www.pearsonschools.co.uk/engtechres

Get set for assessment

In this section...

- » Why the combination of internal and external assessment?
- » How does assessment work?
- » How does grading work?
- » Your support for assessment

Why the combination of internal and external assessment?

The combination of internal and external assessment means your students will develop the knowledge, understanding and skills they need and then have the opportunity to put this learning into practice through a real-life scenario.

Internally assessed assignments

The focus is on your students developing their knowledge, understanding and skills.

Component 1 example assignment:

Your students produce a design proposal for an engineered product, based on a customer brief.

Component 2 example assignment:

Your students select an engineered product, investigate its construction and reproduce a component from it.

Externally assessed task

The focus is on your students putting their learning into practice through real-life scenarios.

Component 3 example task:

Your students are asked to carry out research into different types of elasticated ropes that can be used to lower supplies from a helicopter.

How does the assessment work?

Retaining the BTEC approach

Internal assessment

We've retained the well-established BTEC approach, adapted to fit the specific needs of this qualification. These assignments are set by your school assessment team, using guidance and examples provided by us. Students are given an assignment brief with a defined start date, completion date, and clear requirements for evidence needed. This assignment is then internally and externally verified.

Can my students resubmit?

There will be one opportunity to resubmit improved evidence, once approved with your Lead Internal Verifier.



Why do we use verification?

We have chosen to verify rather than moderate our assignments; this means you can receive feedback on individual students and understand and track their performance at every stage - avoiding any last minute surprises.



Want to know more?

More detail on internal assignments is in section 5 of your specification.

quals.pearson.com/TAengineering

- ✔ One re-submission
- ✔ One retake (with a new assignment)

Task over tests

External assessment

We realise that BTEC students should be assessed in a way that suits vocational learning. That's why our new Tech Awards use task-based external assessments rather than traditional exam formats.

When can my students take the external assessment?

There is one externally assessed component (Component 3), designed to be synoptic (drawing together knowledge from the previous components) and taken near the end of the course.

There will be two assessment sittings per year, in February and May/June, from 2019 onwards.

Can my students resit?

Your students will have one opportunity to resit.



Want to see an example task?

See the sample assessment material (SAM) on our website.

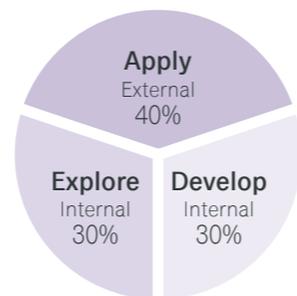
quals.pearson.com/TAengineering

- ✔ One resit
- 📅 External assessment takes place in February or May/June



How does the grading work?

Students achieve a grade for each component, which are allocated points. At the end of the course, we calculate the final grade by adding the points from each component, and matching this against the qualification grade point thresholds.



Internally assessed		Externally assessed	Final qualification grade
Explore - 30%	Develop - 30%	Apply - 40%	
PASSED ☑	PASSED ☑	PASSED ☑	

Example			Final qualification grade
29 Points	36 Points	36 Points	
Grade Level 2 - Merit	Grade Level 2 - Distinction	Grade Level 2 - Merit	101 Points
			Final Grade Level 2 - Merit

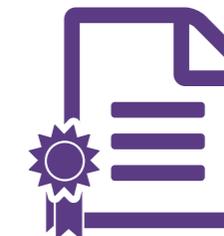
i For more information on internal and external grading see section 8 of the specification.

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Full grading

Our qualification goes from Level 1 Pass to Level 2 Distinction* to ensure all students' achievements are recognised. Students need to achieve a L1 Pass or above in the three components to achieve the qualification.



Qualification grade point thresholds

Level 2 Distinction* · 114 points
Level 2 Distinction · 105 points
Level 2 Merit · 95 points
Level 2 Pass · 72 points
Level 1 Distinction · 58 points
Level 1 Merit · 44 points
Level 1 Pass · 30 points

i For more information on grading see section 8 of the specification.

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Your support for assessment



Sample Assessment Material

You can download Sample Assessment Material for Component 3 from our website, to give you an idea of what the tasks will look like. This also includes a mark scheme and marking guidance, so that you can see what is required from your students at each level.

quals.pearson.com/TAengineering



Authorised Assignment Briefs

You can download Authorised Assignment Briefs for each of the Learning Aims of Component 1 and 2 from our website. You can use these with your students as they are, tailor them to fit your students, or use them as inspiration to develop your own briefs.

quals.pearson.com/TAengineering



Sample Marked Learner Work

Sample Marked Learner Work will be available on our website. This will give you an example of students' responses at pass, merit, and distinction grades.

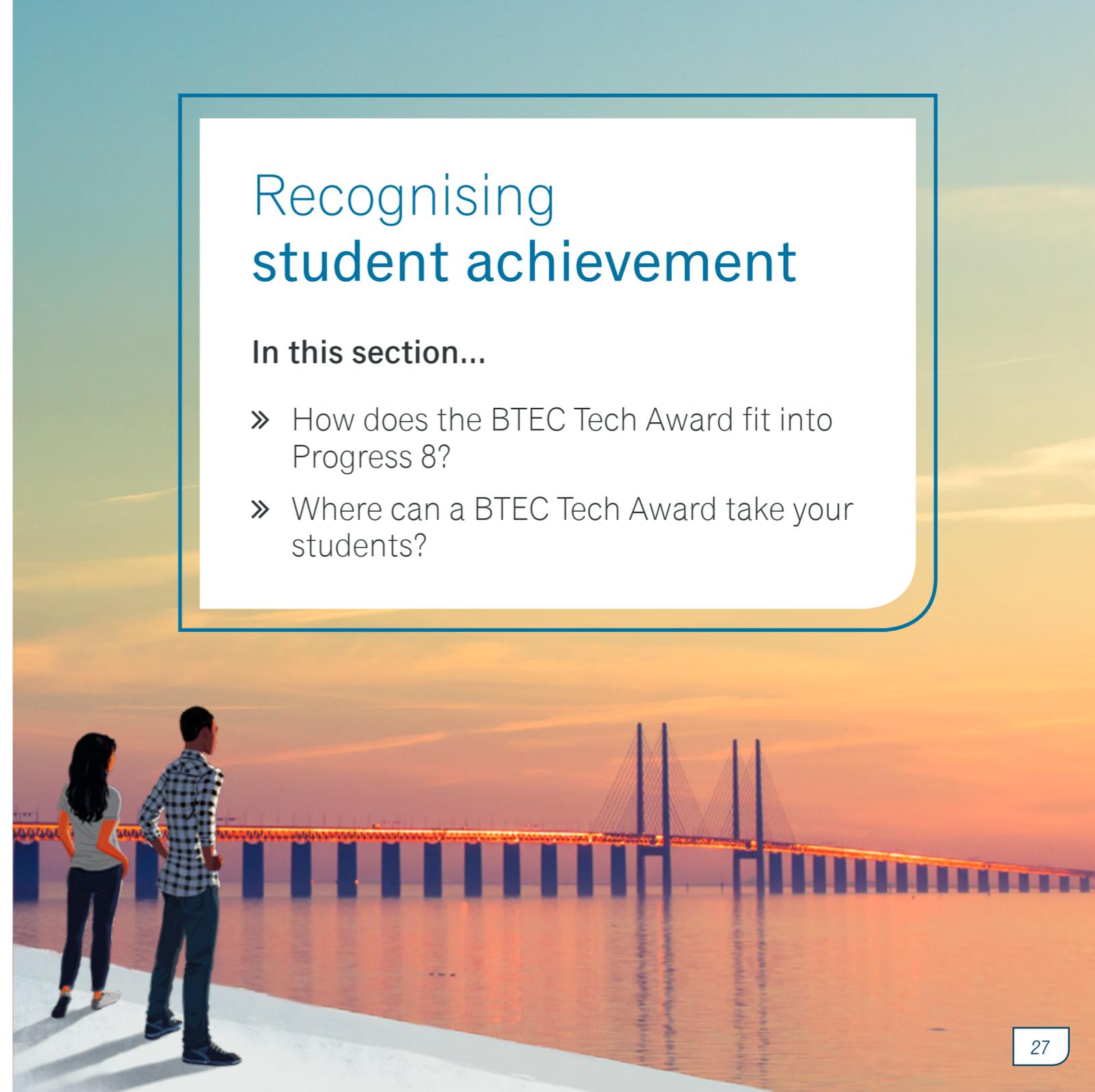
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Published Support

Our Student Book and Teaching Resources contain specific activities on preparing for assessment, making sure your students have plenty of chance to practice.

See pages 14-17 of this guide to find out more



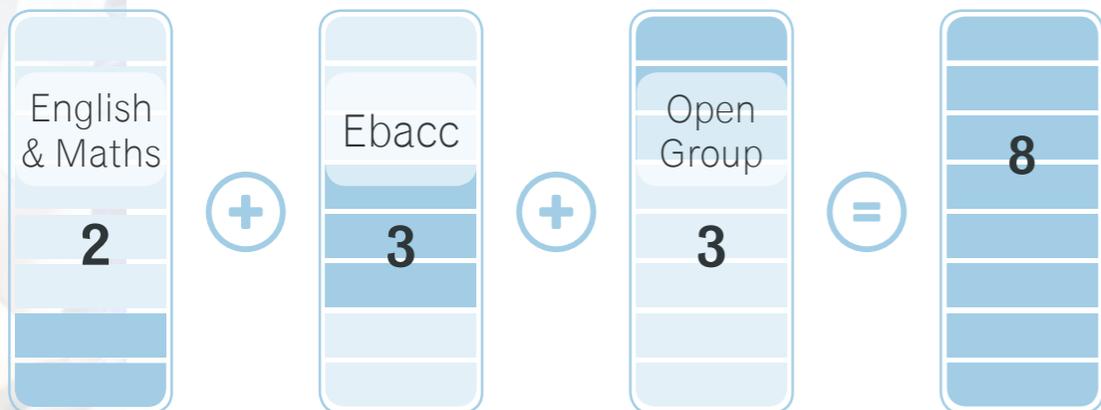
Recognising student achievement

In this section...

- » How does the BTEC Tech Award fit into Progress 8?
- » Where can a BTEC Tech Award take your students?

How does the BTEC Tech Award fit into Progress 8?

The BTEC Tech Award in Engineering has been **included on the DfE List of qualifications** which will count towards performance tables in England and Northern Ireland (2019 results), meaning that it can be included in the third tier of Progress 8: the 'open' (non-EBacc) category.



Once BTEC Tech Awards are included on the Key Stage 4 performance tables (2019 results), your students can take up to 3 BTEC Tech Awards in the "Open Group" alongside their GCSEs.

Where can a BTEC Tech Award take your students?

What will my students gain from a BTEC Tech Award?



Practical, transferable skills

BTEC Tech Awards focus on building skills which will give your students the confidence to progress in whatever path they choose.



A taster of the sector

The BTEC Tech Award is a practical introduction to life and work in Engineering, so your students can develop their understanding of the sector and see whether it's an industry they'd like to be in.



A well-rounded foundation for further study

As they're designed to be taken alongside GCSEs, with a BTEC Tech Award your KS4 students have the opportunity to apply academic knowledge to everyday and work contexts, giving them a great starting point for academic or vocational study post-16, as well as preparing them for future employment.

Recognised by employers and universities

In 2017, nearly 1 in 4 students who entered university in the UK did so with a BTEC. BTEC is a recognised and well-known qualification suite, providing reassurance that students who study a BTEC meet the levels required by employers and Higher Education.

What are my students' options for progression after the course?

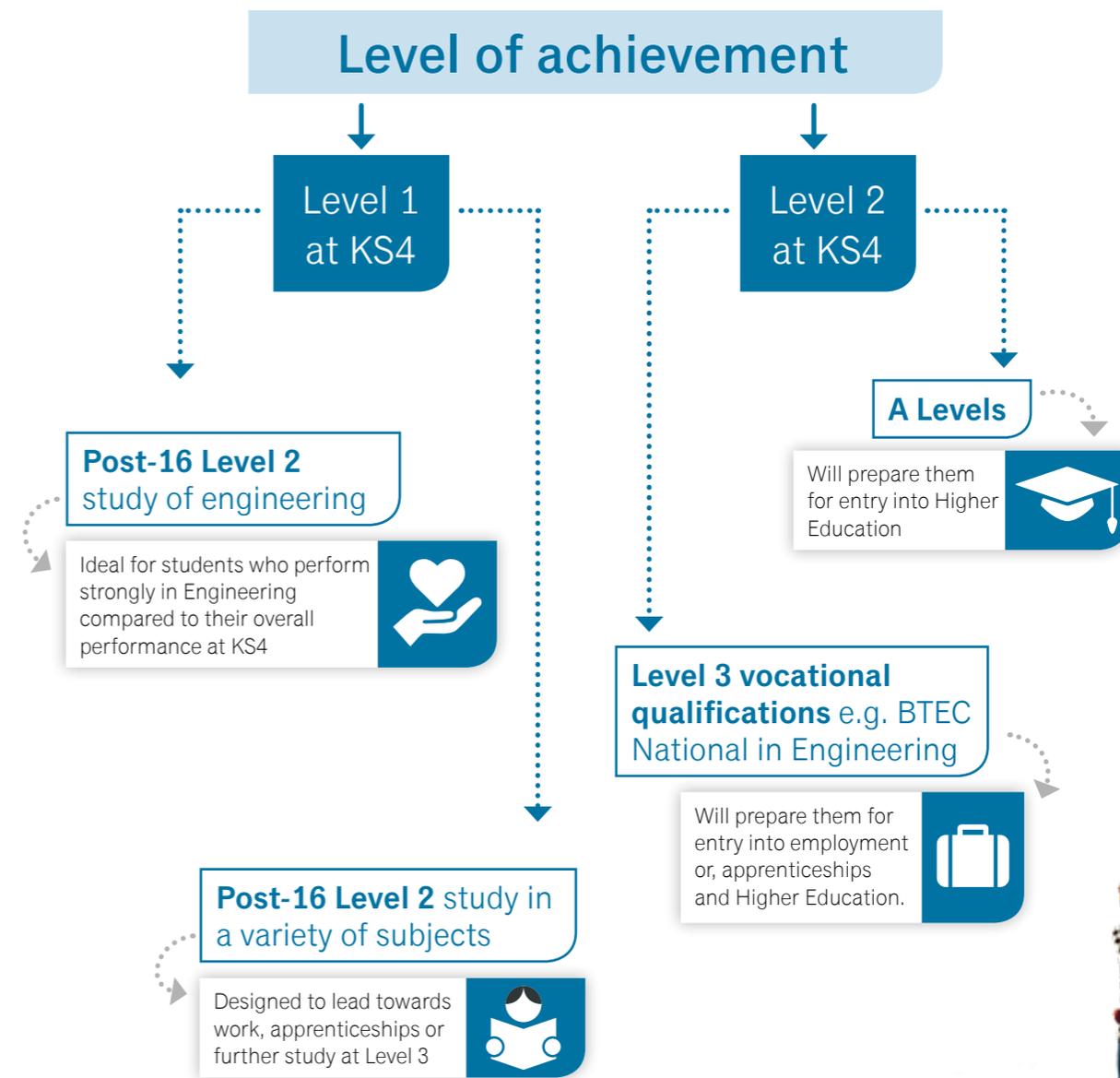
After completing their BTEC Tech Award, your students will be in a great position to continue in the engineering sector. This qualification prepares students for both practical and academic routes.



Between 2010 and 2020 engineering companies in the UK are projected to have **2.74 million** job openings

Electronics
Manufacturing
Welding
Agri-food
Telecommunications
Renewable energy
Space
Low carbon
Automotive
Bioscience
Welding

Where can my students progress to?



Your next steps

If you like what you see, and are interested in the BTEC Tech Award in Engineering, then:



Download your specification for a more detailed look at the course:

quals.pearson.com/TAengineering



Get in touch with your Subject Advisor, Evren Alibaba with any queries.

✉ TeachingEngineering@pearson.com

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The skills to succeed - the confidence to progress

