Engineering
Explorer Programme

Workbook

Pearson

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Information about Explorer Programmes

Explorer Programmes are offered by Pearson to give learners who are considering a sector-based course a realistic idea of what the sector will be like to work in. This includes the vast opportunities the sector will present but also the challenges. Explorer Programmes are available in a variety of sectors, including engineering.

The Explorer Programmes are suitable for learners who are considering either BTEC or Apprenticeship routes. The purpose is for learners to find out if a career in Engineering is one that will work for them and to plan for the future. We have also produced a video to support each course, including advice about career progression from the Pearson sector manager for Engineering.

This course is split into the following four modules:

Module 1: Finding out about yourself

Module 2: Finding out about the sector

Module 3: The Engineering course

Module 4: Next steps towards your career

Explorers are delivered as an accredited course using a regulated qualification or a single unit to support delivery, which can be certificated. The options are funded for 19+ learners under the local flexibility funding stream of the Adult Education Budget.

Centres can choose to deliver Explorers as:

- **Option 1**: An accredited qualification **or** unit. This means the learner will be certificated by Pearson for the Level 1 Award in WorkSkills, **or** a single sector unit. We have linked Explorers to the Level 1 Award in WorkSkills and in most cases to an individual sector unit, so learners can potentially take more than one Explorer in different sectors.
- **Option 2**: An accredited qualification **and** unit. This means the learner will be certificated by Pearson for the Level 1 Award in WorkSkills **and** a single sector unit. Centres should consider this option carefully as it may result in content duplication and affect funding.

The Engineering Explorer leads to achievement of the following full qualification or single additional unit:

- 601/9014/0 Pearson BTEC Level 1 30-GLH Award in Workskills. The qualification specification can be found here, and the units can be found here.
- L/503/3425 Starting Work in Engineering (Level 1 unit from BTEC Award in Engineering) (40 glh/4 units) (unit 11, page 95).

It is vital when delivering accredited courses, that the evidence is full. Centres need to refer to the qualification and/or unit specification. Learners need to follow specification instructions, for example, when 'describing', 'listing' or 'identifying'. The workbook signposts individual unit assessment criteria.

What next?

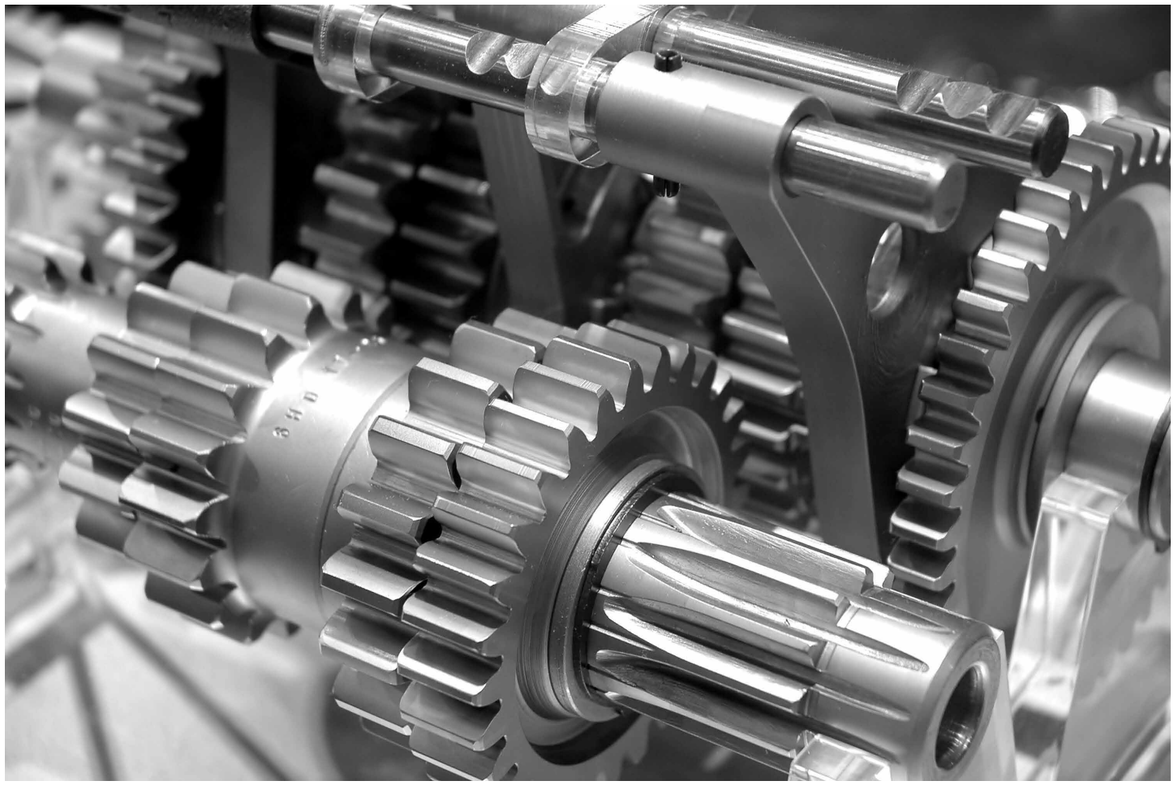
Learners who have taken this Explorer Programme could potentially complete the following qualifications and apprenticeships in the sector:

Apprenticeship

- Level 2 in Engineering

Qualifications, full-time study

- Level 2 Technical Certificate in Engineering
- Level 2 Technical Diploma in Engineering
- Pearson BTEC Level 3 Nationals in Engineering



Engineering Sector Explorer Programme Workbook

Engineering is a dynamic sector, offering huge potential for career entrants. Engineering turnover was £1.23 trillion in the year ending March 2016 and it accounts for 23% of the turnover of all enterprises in the UK.

The UK is regarded as a world leader in engineering sector, including renewable energy, space, low carbon emission, aerospace, creative industries, utilities, automotive, agri-food and bioscience.

Between 2010 and 2020, engineering enterprises are projected to have 2.74 million job openings, including more than 400,000 technician roles, as the predominantly ageing workforce is expected to retire in this period.

The following infographic from the annual State of the Engineering report, produced by Engineering UK, shows the research about future job requirements within the engineering sector.

The full report can be accessed here
https://www.engineeringuk.com/research/engineering-uk-report/

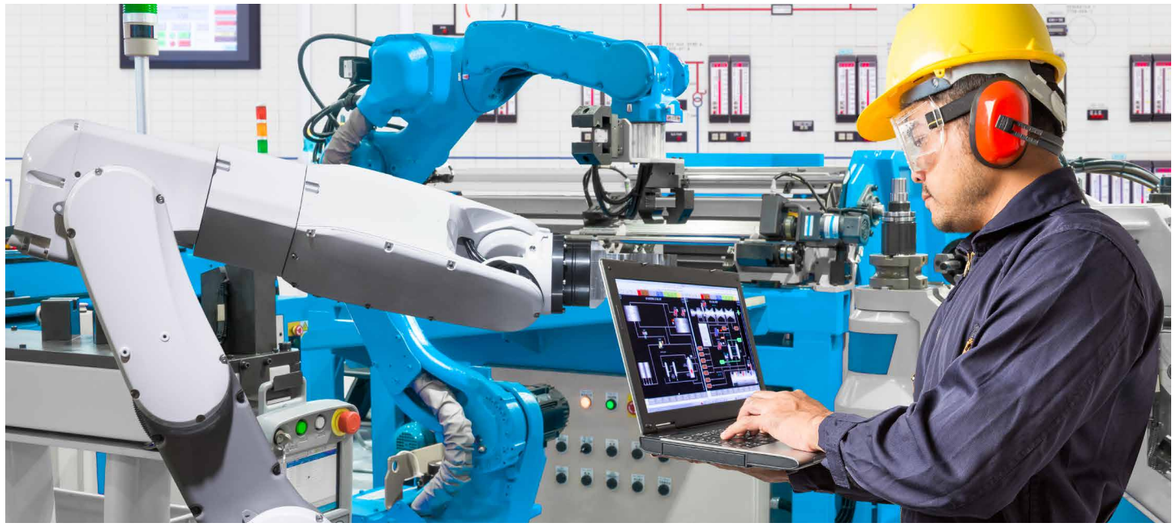
Entry level roles in engineering include lean manufacturing operatives or engineering operatives. These operatives carry out duties such as fabrication and basic welding or in an assembly capacity.

Pathways are available in areas such as:

- aeronautical engineering
- automotive engineering
- computer Engineering
- electrical and electronic engineering
- manufacturing engineering
- mechanical engineering.

The opportunities within the engineering and manufacturing sector are varied; by upskilling and completing higher-level qualifications you can become an engineering technician, an engineer or even a senior engineer. Salaries in the engineering sector are often higher than the national average.

Whatever you decide to do it will be hard work, but it will be interesting, every day will be different and you could be making a difference to the daily lives of individuals. What could be better than that?



Module 1 – Finding out about yourself

The first step in this course is to consider the skills and aptitudes that you have and then match these to what is required in the sector.

It is really important to consider what you are good at when planning your career path. The most successful people are usually well aware of what they are good at and how they can use these strengths. This section also considers weaknesses, but in planning your career it is most important that this matches with what you are comfortable and happy doing.

Icebreaker Activity 1a – Myers–Briggs Personality test

Have you ever taken a personality test? It is informative and also a fun way of finding out about yourself. It is also interesting to compare similarities and differences between people and it will help you to get to know other people in the group. If you have taken it before try again to see if you get the same result.

Task 1: Take the test on this website: https://www.16personalities.com/free-personality-test

Task 2: Record the main outcomes of your test in the table below:

Personality type	
Individual traits	
Role	
Strategy	
Strengths	
Weaknesses	
Career paths	

Task 3: Reflection

Discuss the following points as a group:

- Do you agree with the results of this test?
- Compare results to others – what are the similarities and differences?
- How do you think this result is useful?

Notes

Activity 1b – Self-assessment (J/508/3479 1.1 ; 1.2)

The aim of this activity is to help you to understand what you are good at and enjoy. People are more successful in jobs that match the type of person that they are and what they are good at. To help you understand – a strength is something you are good at, and a weakness is something you are not so good at. While a skill is something you have learned (like riding a bike) but a quality is something you are born with, such as being a good listener.

Fill in the table on the next page as honestly and as fully as you can, using bullet points. Don't be modest!

Task 1: Fill in the table on the next page on your own. Aim for five points in each box.

NB if you are claiming unit J/508/3479 the minimum requirement is two points.

Task 2: Review the table with three people who know you well, such as a good friend, a work colleague, your supervisor, family, or a college tutor. Ask the people if they agree and whether they can think of any other points.

Describe your strengths?	What are your weaknesses?
What do you enjoy?	What do you dislike doing?
Describe the skills and qualities that you have?	What skills need developing?

Activity 1c – What is needed in the engineering sector?

Task 1: The table below identifies some of the key skills/ values/ competencies for the engineering sector. Rate your own skills between 1 (low) and 5 (high) for each.

Personal skills, values and qualities	Score (1=low, 5=high)					Comments
	1	2	3	4	5	
Attention to detail						
Communication skills						
Ability to follow instructions						
Willingness to work hard and finish tasks						
Ability to cope under pressure						
Complying with health and safety requirements						
Treating people with respect						
Being able to manage own time						
Take responsibility for own actions						
Ability to work in a team						
Good numeracy skills						
Ability to solve problems						
Ability to work on own initiative						

Task 2i:

Having completed module 1, to what extent do you think that you are suited to working in the engineering sector? What do you think you need to develop to be successful and happy in this sector?

Task 2ii: (J/508/3496 1.1; 1.2)

Knowing what you are good at and considering your strengths, skills and qualities are important steps in planning for your future. It might seem odd to think about the jobs and activities you will be carrying out in years to come but a little bit of planning at this stage can make all the difference in the future.

Planning your career doesn't mean making choices that you are stuck with, but it does mean that you are able to recognise the skills and qualities you are developing so that you can move from job to job. This is known as career progression.

Working in pairs, discuss with your class partner why you think career progression might be important and how you will benefit from progressing. Then use the space below to describe the ways in which career progression will be important for you.

Describe **three ways** that career progression is important and describe at least **two benefits** to you of progressing in your career.

Module 2 – Working in the sector

In this module you will find out more about the different engineering industries and will start to think about what working in the sector will be like.

Try to be open-minded about what the sector is like to work in and the opportunities available to you.

Activity 2a – Pearson engineering video

Watch the Pearson engineering video, which concentrates on the different options and career routes available in engineering. Use the space below to make notes about the qualifications and career opportunities that the sector manager talks about.

Notes

Activity 2b – True/false activity to get you thinking

Task 1: Place a tick by true or false for the questions below. If you aren't sure, then make your best guess, some may not even have an absolute correct answer.

Statement	True	False
Engineering is only about fixing cars		
Engineers never work as part of a team		
Engineers are not good at communication		
Engineering only has three different specialist areas that you can work in		
The UK needs engineers		
All engineering jobs are in dirty factories		
Engineers need good numeracy skills		
Engineering is about looking at how to solve problems		
Engineering uses the latest technology		
You need to have a good attention to detail to be an engineer		
Engineering doesn't pay as well as a job in an office		
You cannot become a manager in engineering		
You can specialise in areas like artificial intelligence or space technology (i.e. satellites and rockets)		
Engineering covers many different areas like the military, motorsport and video gaming		
Engineering is just for men		
Engineers can travel the world as part of their job		

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Task 2: Compare and discuss the answers that you have with another member of the group. Has this activity made either of you rethink anything? If there are answers you are unsure about, discuss these with your tutor.

Notes

Activity 2c – Would I like/be good at this job? (J/600/3712 1.1; 1.2)

There are lots of resources available online to help you find out more about the engineering sector and specific roles. For example:

www.tomorrowsengineers.org.uk

www.theiet.org

http://educatingengineers.com/career-specialties

https://icould.com/stories/job-types/engineering/?gclid=EAIaIQobChMIi-iFu7P73AIV753tCh3KuAbEEAAYAyAAEgIszfD_BwE

https://nationalcareersservice.direct.gov.uk/job-profiles/manufacturing-and-engineering

www.engineerjobs.co.uk/careers-advice/where-to-start/the-different-types-of-engineering-sectors

Notes

This activity encourages you to investigate these and to look again at the Pearson engineering video in which the sector manager advises about the different progression routes for engineering.

Activity 2d – Career case studies (L/503/3425 2.1)

Task 1: You will have seen that the engineering sector is a wide one, including areas such as general engineering, mechanical engineering, maintenance and manufacturing. It also includes roles in the rail, automotive, aerospace, marine, nuclear, energy and composites industries.

Now you need to know what type of organisations offer engineering opportunities. Read as many case studies/organisation profiles online as you can and in the space below describe two different types of organisation. One should be a large organisation that delivers major engineering projects, while the other should be a small- or medium-sized organisation.

Use this website to help you:
https://nationalcareersservice.direct.gov.uk/job-profiles/home

Organisation and size	Work undertaken
1	1
	2
	3
2	1
	2
	3

Task 2: Select two career case studies from different areas within engineering – for example, electrical and mechanical – read as many of the online case studies as you can before you select one. The link below will help you:

www.engineerjobs.co.uk/careers-advice/where-to-start/the-different-types-of-engineering-sectors

Summarise each of the two roles and, using the tables provided, identify things that you would like and would not like about each.

A. Role 1

Job title	
Main tasks	
What you would like	
What you would dislike	

B. Role 2

Job title	
Main tasks	
Career path	
What they are doing now	
What you would like	
What you would dislike	

Activity 2e – Where can I find out about jobs? (J/508/3479 2.1)

Finding the right job for you is based on knowing where to look. There will be a number of places where you can find jobs available in the local area. Use the space below to list different sources of local job information.

Activity 2f – Available jobs

Find three job adverts for roles in the engineering sector in your local area or in the area in which you will want to work. Collect printouts of the roles you have looked at and write on each one where you found it, (these should be from different places). For each job, fill in the information in the table below.

	Role 1	Role 2	Role 3
Job title			
Description of job			
Work pattern			

Salary			
Benefits			
Qualifications needed			
Other requirements			
Employer information			
Skills needed			
Qualities needed			

Activity 2g – Can I do this job?

Find out the following information about jobs in the engineering sector. Feel free to include anything else that you find that is of interest.

- Normal working patterns once qualified
- Contract status (zero hours/permanent etc.)
- Pay rates
- Requirements in relation to health and fitness/reasonable adjustments for disability
- Any other requirements, e.g. criminal record/insolvency
- Anything else of interest

Use the following links to help you:

- www.tomorrowsengineers.org.uk
- www.theiet.org
- http://educatingengineers.com/career-specialties
- https://icould.com/stories/job-types/engineering/?gclid=EAIaIQobChMIi-iFu7P73AIV753tCh3KuAbEEAAYAyAAEgIszfD_BwE
- https://nationalcareersservice.direct.gov.uk/job-profiles/manufacturing-and-engineering
- https://www.engineerjobs.co.uk/careers-advice/where-to-start/the-different-types-of-engineering-sectors

Module 3 – The engineering course

In this section you will find out more about the different routes into the industry and it will help you to decide what the best course of action is for you.

There is a range of options, including classroom-based courses and work-based apprenticeships where you learn on the job. You will also take part in explorer activities that will give you an idea about the difference between the BTEC and Apprenticeship routes, and what may be expected on the different courses.

Activity 3a – Finding out about the options

This activity concentrates on you understanding what the options are for entering the engineering sector.

Task 1: Watch the section of the Pearson engineering video where the Pearson sector manager explains the differences between the qualifications.

Task 2: Research the different qualification routes and select the route that you think would suit you best. Explain why.

Notes

Task 3: Referring to the Engineering progression routes on the webpage, identify the career route and level you think would suit you best and explain why in the box below.

- Apprenticeships – Opportunity to earn while you learn
- Technical – College-based learning
- Applied – Full time college-based learning

Notes

Activity 3b – Engineering explorer activity (L/5013/3425 5.1; 6.1; 6.2)

The London Eye

The London Eye is a giant Ferris wheel situated on the South Bank of the River Thames in London.

It is constructed primarily from steel and glass; with a rim formed from a triangulated truss, internal tension cables and specially designed glass capsules to transport passengers. The internal diameter of the wheel itself is 120m, and standing at 135 m high, the London Eye is the tallest Ferris wheel of its kind in Europe.

The London Eye was formally opened on 31 December 1999 by the Prime Minister, as part of the celebration of the new millennium. At that time, it was known as the Millennium Wheel.

For the tasks below you will be observed by your tutor to assess your team working skills.

Task 1: Working as part of a group, prepare a scale sketch of the London Eye, clearly identifying the key components of the structure. You should include the rim, A-Frame, tension cables, spindle, hub and bearing, capsules and boarding platform. You can find images of the London Eye at www.londoneye.com.

Task 2: Working in the same group, review a map of the South Bank area in London where the wheel is located. Decide how you might transport and raise the 135 m high wheel into position.

Now watch the following videos on the development and construction of the London Eye:

- Building the London Eye extracts from "The Biggest Wheel in the World at https://www.youtube.com/watch?v=gUkLy-7M8f8
- Raising the London Eye at https://www.youtube.com/watch?v=gfrCVHd6NQo

Task 3: Given what you have learned about the London Eye project and potential careers in engineering, discuss with your group all of the different engineering job roles that played a part in the London Eye's design, construction and erection.

Task 4: Since the completion of the London Eye in 1999, a number of other Ferris wheels have been built across the world. Working in your group, research the; location of these wheels and who constructed them.

Assessor observations to be completed by tutor

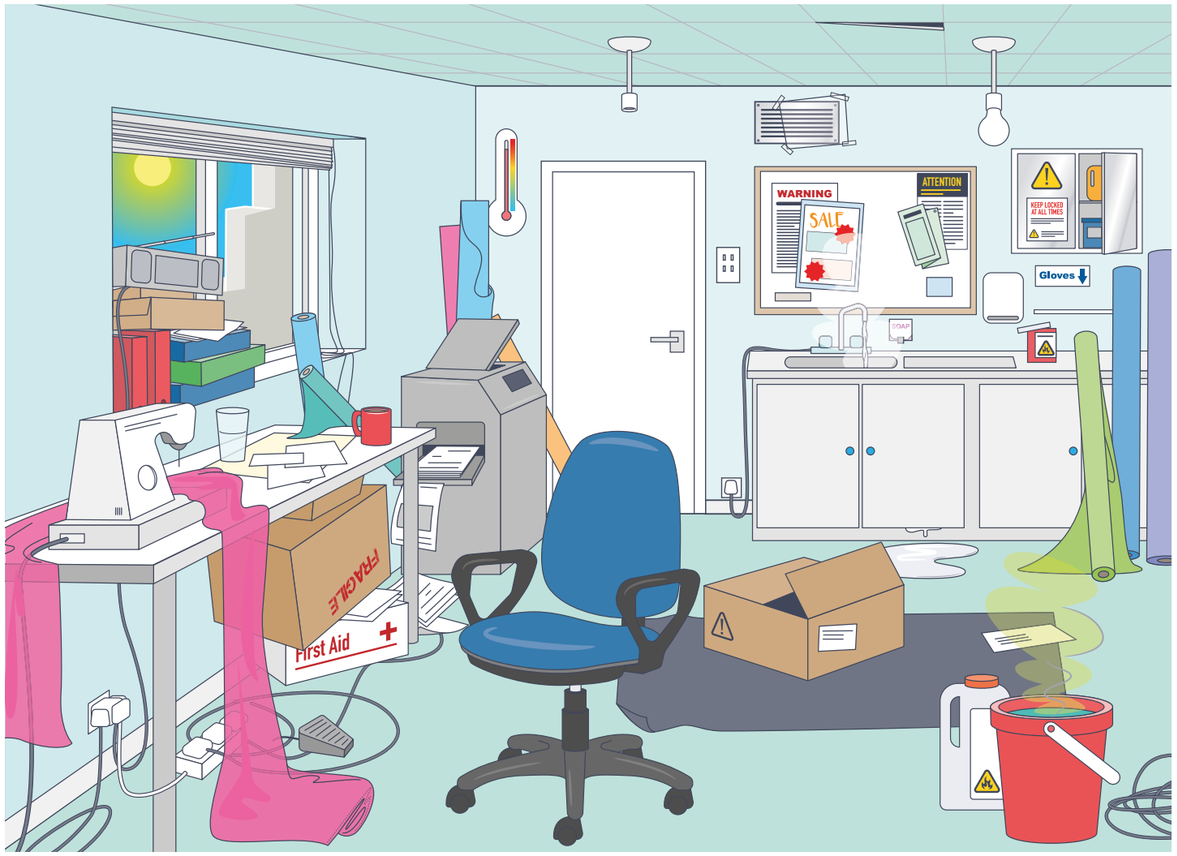
How did the individual demonstrate good team working skills?
How successful was the individual in following instructions?
How well did the individual communicate? (Provide examples)

Signed	Date

Activity 3c – Apprenticeship work-related explorer activity

Work place hazards

Task 1: You are working in a workshop as an apprentice and you have been asked to identify the 20 health and safety hazards in the picture below, and to list which health and safety regulation it is covered by. (Use the table below to record your findings.)



	Health and safety hazards in the workshop	
	Type of hazard	Covered by health and safety regulation…
A		
B		
C		
D		
E		
F		
G		
H		
I		
J		
K		
L		
M		
N		
O		
P		
Q		
R		
S		
T		

Task 2: When you have identified the hazards in the picture to the left, prepare a five-slide presentation and speaker notes about the importance of health and safety in an engineering or manufacturing environment.

Module 4 – Next steps towards your career

This section is where you put plans together to enter the engineering sector. This includes reflecting on the course so far, and planning your next steps by setting goals to work towards.

Activity 4a – Reflecting on the Explorer Programme (J/508/3479 1.3; 2.2; 2.3 J/508/3496 2.1; 2.2; 2.3)

Take an hour to reflect individually on what you have learned about yourself, the sector and potential courses. Write some notes/thoughts in response to the prompts below.

Explain how your own skills, qualities and interests help you in your personal life, and how they can be transferred to support you in work.

Use the information you have gained to choose two suitable career paths within the engineering industry and describe the skills and experience that will be needed to succeed in that area.

How do your skills and experience match up to these career paths, note where you have suitable skills and experience already and identify where there is not a match.

Make a list of potential jobs that interest you within your chosen career paths.

Choose one role that you think offers you the best chance of success should you apply for it and match your strengths, skills and qualities against the role, identifying any gaps that you would need to develop before you could apply.

Is it something that practically fits with your life? Explain how your lifestyle might be affected by the career choice that you make. Think about impacts on your health, your working conditions, your hours of work, travelling time and the impact on your family and social life.

What are you looking forward to/worried about?

Activity 4b – Planning next steps (J/508/3479 3.1; 3.2; 3.3 J/508/3496 3.1; 3.2; 3.3)

To plan next steps, you need to set yourself goals based on what you need to develop in order to be successful in the engineering sector. In order to do this, you need to set one long-term goal, two medium-term SMART goals and two short-term SMART goals, and include a plan about how you are going to achieve them. Make sure you include career and course options.

SMART goals are:

S = Specific – well defined and clear

M = Measurable – able to monitor/measure 'the journey'

A = Achievable – goals should be possible, don't set yourself up to not achieve

R = Realistic – is the objective relevant and appropriate to your overall objective?

T = Time bound – is there enough time available to enable you to achieve the objective?

Long-term goals (in the next 3 years)	
Goals	How I will achieve this
1	

Medium-term goals (in the next year)	
Goals	How I will achieve this
1	
2	

Short-term goals (in the next 2 months)	
Goals	How I will achieve this
1	
2	
3	

For more information please contact your Pearson Subject Advisor

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