Supporting Technical Education Teaching:

**Curriculum Resources**

Teaching Guide

Topic: Working within the health and science sectors

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| --- | --- |
| **Route** | Health & Science |
| **Qualification** | T Level Technical Qualification in Science (Level 3) (Delivered By NCFE) [www.ncfe.org.uk/qualification-search/qualification-detail/t-level-technical-qualification-in-science-level-3-delivered-by-ncfe-883](http://www.ncfe.org.uk/qualification-search/qualification-detail/t-level-technical-qualification-in-science-level-3-delivered-by-ncfe-883) |
| **Topic** | Working within the health and science sectors |
| **Specification coverage** | **A1: Working within the health and science sector**A1.1, A1.2, A1.3, A1.4, A1.5, A1.6**A2: The science sector**A2.1, A2.2, A2.3 |

This resource is part of a series of materials to support technical education teaching. The approach to developing the materials draws from research led by Professor Kevin Orr that sets out a model for understanding of technical education pedagogy.

The curriculum development begins with the knowledge that students are working to learn and apply. Teachers draw from their subject and industry expertise, and their knowledge of their students, to make decisions about the core concepts the curriculum will focus on, how they will sequence these concepts, and the activities that are selected to support students’ learning. The decisions behind the resources suggested in this topic are the result of choices made by the curriculum development team, which will be reviewed and improved by teachers’ decision-making and ongoing reflection in their own circumstances.

The materials also seek to support teachers in bringing the classroom and industry closer together, by providing assets that draw from authentic industry materials, and using opportunities to capture workplace practice that can be shared with students.



HEALTH AND SAFETY

This topic has been safety checked but not trialled by CLEAPSS.

It is assumed that activities outlined in this Teaching Guide will be undertaken in suitable facilities or work areas and that good practices, appropriate use policies and procedures will be observed. Teachers should consult their employers’ risk assessments before use and consider whether any modification is necessary for the particular circumstances of their own class/institution.

For practical activities, the Technical Education Networks programme has tried to ensure that experiments are healthy and safe to use in colleges and schools, and that any recognised hazards have been indicated together with appropriate control measures (safety precautions). It is assumed that experiments and activities will be undertaken in suitable laboratories or work areas and that good laboratory practices will be observed. To access the CLEAPSS materials in this suite, institutions will need to be a member of CLEAPSS. Further details are available at [www.cleapss.org.uk](http://www.cleapss.org.uk) If necessary, members can obtain further advice by contacting the Helpline by email at science@cleapss.org.uk or on 01895 251496.

Materials for other topics are available at: [www.technicaleducationnetworks.org.uk](http://www.technicaleducationnetworks.org.uk)

Acknowledgments

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Introduction

This document for teachers outlines both the topic and the approach to using the suite of resources for each lesson.

# Topic purpose

This topic is an introduction to working in the health and science sectors, and a range of available careers. It builds students’ knowledge and understanding of key policies, industry codes of conduct, and ethical practice in the workplace. Students will need to be familiar with these concepts before beginning their industry placements.

Understanding the importance and application of safeguarding is a duty for all those with relevant training who are undertaking to support practitioners in their roles. A link to the current statutory guidance for schools and colleges is available [here](https://www.gov.uk/government/publications/keeping-children-safe-in-education--2) but this should be regularly reviewed and checked for updates. Before using these materials, a sound knowledge of safeguarding and an awareness of any related concerns with students/staff using these materials should be sought and may present an opportunity to reinforce good practice and reporting mechanisms within this suite of lessons. Reference to a provider’s Equality, Diversity and Inclusion policy may also be useful for students.

There are five lessons and each lesson is assumed to be 1.5 hours. You may want to adapt the suggested sequencing of concepts and activities as appropriate for your students and circumstances. The lessons are broken down to provide teacher flexibility on the depth covered in the activities; lessons can also be split over multiple shorter lessons if required.

When used as a sequential series of lessons, the materials have been designed to introduce the content of A1 in lessons 1 and 2, providing a firm foundation for students’ further learning. Lessons 3, 4 and 5 then introduce the diversity of roles within organisations and the science sector in general (A2).

Alternatively, as different topics are introduced in each lesson that (in most cases) do not require previous knowledge of another area, the lessons could be used as individual standalone sessions interspersed during the course. For example, lessons 3, 4 and 5 could be taught during National Careers Week to fit in with other activities taking place in college/school.

There are also opportunities to build several essential skills that are developed during the course and general competencies for maths, English and digital.

The content in the lessons can be reinforced throughout the course to support students’ learning. For example, when discussing a forthcoming industry placement, one objective could be for students to look for these policies in the workplace, discuss the importance with their supervisor, and note this learning in their logbook. For example: support.tlevels.gov.uk/hc/en-gb/articles/360015345420-Industry-placement-logbook-for-students

# Industry importance

People working in the science sector have a diverse range of working environments, from laboratories to fieldwork or analysis roles within an office-based environment. However, in any science-based role, individuals must work with care and consistent accuracy given the potential consequences of errors.

To ensure that people working within the science sector follow best practice for collecting and processing reliable and valid data, and to ensure the safety of themselves and the teams they work with, clear policies and procedures are in place that should be followed at all times. Some of these policies are statutory, such as policies under health and safety legislation. Others are based around the need to work methodically and accurately through experimental procedures and in the processing and analysis of data (there are specific policies for any activities involving living organisms).

It is important that before a student participates in an industry placement, they are aware of the organisation’s values or ‘mission statement’, as these may differ in both their wording and ethos, even though standard practices will not.

Although the range of careers within the science sector is extremely diverse, the fundamental requirements of employees remain consistent across roles and responsibilities. For example, research scientists and technicians working across the disciplines of biology, chemistry and physics will all follow policies with common themes, even though the nature of their work may be markedly different.

“A significant portion of laboratory staff training revolved around grasping the significance of Standard Operating Procedures (SOPs) and cultivating appropriate behaviour within the laboratory environment. This knowledge is foundational to maintaining a strong quality management system (QMS) and upholding the integrity of the results.”

**Tautvydas Karitonas, Managing Director, Test Labs UK**

# Industry links

* The National Careers Service has information about a range of careers in the science sector: [nationalcareers.service.gov.uk/job-categories/science-and-research](https://nationalcareers.service.gov.uk/job-categories/science-and-research)
* Scientists and science technicians may be members of a professional body, such as:
	+ Royal Society of Biology: [www.rsb.org.uk](http://www.rsb.org.uk)
	+ Institute of Physics: [www.iop.org/](http://www.iop.org/)
	+ Royal Society of Chemistry: [www.rsc.org/](http://www.rsc.org/)
	+ Institution of Environmental Sciences: [www.the-ies.org](http://www.the-ies.org)
	+ Institute of Science and Technology: [istonline.org.uk/](https://istonline.org.uk/)
	+ Health and Care Professions Council (HCPC) covers all Allied Health Professionals including biomedical scientists and clinical scientists.
	[www.hcpc-uk.org/](http://www.hcpc-uk.org/)
* The Science Council shows a full list of related professional bodies: [sciencecouncil.org/professional-bodies/](https://sciencecouncil.org/professional-bodies/)

# Prior learning

Students do not require any specific prior knowledge before studying the topic. Whilst the content of this series of lessons is unlikely to have been met by students at GCSE, those who have studied technical programmes previously may have been introduced to some policies and procedures in workplace settings.

# Accessibility

The teaching materials have been designed to provide teachers with a flexible framework, including different approaches to activities, suggested consolidation activities to further embed knowledge, and adaptable study questions to assess learning. As with all resources, teachers will wish to consider the specific needs of their students when using the materials, including Special Educational Needs and Disabilities (SEND).

Learning outcomes and specification coverage

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| **Lesson** | **Learning outcomes** | **Specification coverage** | **Skills and general competencies** | **Links to other content in the specification** |
| **1** | Students will be able to:* name the key organisational policies (Equality, Diversity and inclusion policy, Safeguarding policy, Employment contracts, Performance reviews, Disciplinary policy, Grievance policy) and describe their purpose
* summarise the features of each policy
* justify the use of different policies in real-life scenarios.
 | **A1.1** The purpose of organisational policies and procedures in the health and science sector, including: • equality, diversity and inclusion policy: complying with legislation, ensuring equality, eliminating discrimination • safeguarding policies: ensuring the protection from harm of individuals, including those working within the organisation and visitors • employment contracts: setting out employment conditions, rights, responsibilities and duties • performance reviews: evaluating work performance against standards and expectations, facilitating feedback to improve, providing opportunities to raise concerns or issues, contributing to continuing professional development (CPD) • disciplinary policy: setting and maintaining expected standards of work and conduct, ensuring consistent and fair treatment, establishing a sequence for disciplinary action • grievance policy: providing opportunities for employees to confidentially raise and address grievances, establishing a sequence for raising grievances | Skills**CS2.1** Researching**CS3.1, CS3.2** Working with others**CS4.1** Creativity and innovationGeneral competenciesEnglish: **GEC2** Present information and ideas**GEC3** Create texts for different purposes and audiences**GEC4** Summarise information/ideas**GEC5** Synthesise information**GEC6** Take part in/lead discussionsDigital: **GDC2** Design, create and edit documents and digital media**GDC3** Communicate and collaborate | **A3** Health, safety and environmental regulations in the health and science sector**A8** Good scientific and clinical practice |
| **2** | Students will be able to:* describe what is meant by an audit and why they are important
* state what is meant by a professional code of conduct
* describe some of the key factors in ethical practice
* define the key terms; autonomy, informed consent, truthfulness, confidentiality, beneficence, nonmaleficence and justice.
 | **A1.2** The importance of adhering to quality standards, quality management and audit processes within the health and science sector: • ensuring consistency • maintaining health and safety • monitoring processes and procedures • facilitating continuous improvement • facilitating objective, independent review**A1.3** The key principles of ethical practice in the health and science sector: • autonomy and informed consent • truthfulness and confidentiality (for example, ensuring validity of outcomes) • beneficence • nonmaleficence • justice (for example fairness, equality and respect for all)**A1.4** The purpose of following professional codes of conduct: • clarifies missions, values, principles and standards that everyone must adhere to by: outlining expected professional behaviours and attitudes, outlining rules and responsibilities within particular organisations, promoting confidence in the organisation | Skills**CS2.1** Researching**CS3.1, CS3.2** Working with others**CS4.1** Creativity and innovationGeneral competenciesEnglish:**GEC4** Summarise information/ideas**GEC5** Synthesise information**GEC6** Take part in/lead discussionsDigital:**GDC1** Use digital technology and media effectively, **GDC3** Communicate and collaborate | **A3** Health, safety and environmental regulations in the health and science sector**A8** Good scientific and clinical practice |
| **3** | Students will be able to:* Describe some of the diversity of roles that exist within the science and health sector
* Classify occupations as technical, higher technical or professional
* Describe a range of science career opportunities they can access after completing this course, and the next steps they need to take to get there
 | **A1.5** The difference between technical, higher technical and professional occupations in health, healthcare science and science, as defined by the Institute for Apprenticeships and Technical Education occupational maps: • technical: skilled occupations that a college leaver or an apprentice would be entering, typically requiring qualifications at levels 2/3 • higher technical: require more knowledge and skills acquired through experience in the workplace or further technical education, and typically require qualifications at levels 4/5 • professional: occupations where there is a clear career progression from higher technical occupations, as well as occupations where a degree apprenticeship exists**A1.6** Opportunities to support progression within the health and science sector: • undertaking further/higher education programmes • undertaking apprenticeship/degree apprenticeship • undertaking continuing professional development (CPD) • gaining professional registration • undertaking an internship • undertaking a scholarship | Skills**CS2.1** Researching**CS3.1** Working with othersGeneral competenciesEnglish:**GEC4** Summarise information/ideas**GEC5** Synthesise information**GEC6** Take part in/lead discussionsDigital: **GDC1** Use digital technology and media effectively, **GDC3** Communicate and collaborate | A2.2 The diversity of work undertaken in different job roles within the science sector |
| **4** | Students will be able to:* describe the factors that contribute to the diversity of employers/organisations within the science sector
* describe the diversity of work undertaken in different jobs within the science sector
* name some jobs which require the application of science in non-science sectors.
 | **A2.1** Factors that contribute to the diversity of employers/organisations within the science sector: • size of employer/organisation • funding streams • commercial status • working environments (for example, laboratory, manufacturing plants, field work) • geographic location **A2.2** The diversity of work undertaken in different job roles within the science sector: • research and development • data analysis • clinical testing/trials • quality control • quality assurance • product development • scientific publishing • manufacturing **A2.3** Possible employers and job roles that require the application of science in non-science sectors: • communication and outreach (for example, science journalist, publisher, public relations, science communication) • education (for example, teacher, museum education officer) • policy (for example, officer/administrator of a scientific professional body/trade association) • public service (for example, civil servant) | Skills**CS3.1, CS3.2** Working with othersGeneral competenciesEnglish: **GEC1** Convey technical information to different audiences**GEC2** Present information and ideas**GEC3** Create texts for different purposes and audiences**GEC4** Summarise information/ideas**GEC5** Synthesise information**GEC6** Take part in/lead discussionsDigital: **GDC1** Use digital technology and media effectively, **GDC2** Design, create and edit documents and digital media**GDC3** Communicate and collaborate |   |
| **5** | Students will be able to:* explore the diversity of work undertaken by science laboratory technicians
* complete an exam-style question to consolidate learning from this topic.
 | **A1.4** The purpose of following professional codes of conduct: • clarifies missions, values, principles and standards that everyone must adhere to by outlining expected professional behaviours and attitudes, outlining rules and responsibilities within particular organisations, promoting confidence in the organisation**A2.1** Factors that contribute to the diversity of employers/organisations within the science sector: • size of employer/organisation • funding streams • commercial status • working environments (for example, laboratory, manufacturing plants, field work) • geographic location **A2.2** The diversity of work undertaken in different job roles within the science sector: • research and development • data analysis • clinical testing/trials • quality control • quality assurance • product development • scientific publishing • manufacturing  | Skills**CS3.1, CS3.2** Working with othersGeneral competenciesEnglish:**GEC2** Present information and ideas**GEC4** Summarise information/ideas**GEC5** Synthesise information**GEC6** Take part in/lead discussionsMaths:**GMC1** Measuring with precision | Occupational specialism: Technical – laboratory sciences  |

Lesson guidance

# Lesson 1: Organisational policies and procedures (A1.1)

This lesson introduces students to some of the main organisational policies and procedures that must be followed when working in the science sector. It is intended to be delivered at the beginning of the course, as it introduces approaches and documentation that will be referred to subsequently. It is recommended that this unit is studied before students begin their industry placement.

## Preparation

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| **Resources provided** | * L1 Slide deck
* Activity 1 – L1 Activity 1 Worksheet
* Activity 2 – Video scenarios in the slide deck
* Consolidation – L1 Consolidation Worksheet
 |
| **Equipment needed** | None  |
| **Safety factors** | None |
| **CLEAPSS references** | None |
| **Prior learning** | * There is no expected prior learning for this lesson, as it does not rely on any previous science knowledge from pre-16 learning. However, students who have previously studied a technical course may have some familiarity with the concepts explored in this lesson.
* Some students may be aware of some organisational policies from any part-time jobs they have had; they may also have relevant experience from friends or family.
 |
| **Accessibility** | * Seek to ensure wide representation for any visiting speakers and case studies used.
* Be aware that students may lack confidence in presenting at this stage of the course. Activities in this topic are an opportunity to establish principles of working in a collaborative manner, in a ‘safe space’.
* For large classes, students could be split into smaller groups for feedback presentations. Alternatively, they could present their findings in different formats, such as short videos or blogs for other students to watch or read.
 |

## Activity guide

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| **Introduction**SUGGESTED TIME: 10 minutesRESOURCES: * L1 Slide deck – slides 2–3
 | * Start by introducing the lesson objectives using the slide deck.
* Students then name three policies that affect their study programme (in pairs or as a whole group). You may wish to follow-up the discussion by asking what other college/school policies relate to them and where they would find these policies in their institution. (Codes of conduct are considered in more detail in lesson 2.)
 |
| **Activity 1: Policies and procedural research**SUGGESTED TIME:20 minutes research, 30 minutes presentationRESOURCES:* L1 Slide deck – slide 4
* L1 Activity 1 Worksheet
 | * This activity supports teaching of students’ research into, and understanding of, workplace policies and procedures.
* In pairs or small groups students research six key organisational policies/procedures: Equality, diversity and inclusion policy, Safeguarding policy, Employment contracts, Performance reviews, Disciplinary policy and Grievance policy. The key information to be drawn on each policy/procedure is detailed on the associated worksheet, along with some example websites to which you could direct students (you may also wish to show students the relevant policies/procedures for your organisation or any additional documents that will be covered in induction to placements).
* Students feed their findings back to the group to produce an overall class table which summarises the key features of each policy/procedure. They can record their research into the summary table on their worksheet. If time allows, students may wish to present their findings in the form of a digital presentation.
* Teachers may choose to initiate a discussion about why these policies are in place and what would happen if they were not.
 |
| **Activity 2: Policy scenario films**SUGGESTED TIME: 20–30 minutes(Allow 5–10 minutes per case study chosen)RESOURCES:* Video scenarios in the slide deck – slides 5–7
 | * This activity tests students’ understanding of the key policies researched in Activity 1.
* Students view a series of scenarios with individuals in the health and science context, introduced via five short video clips. For each scenario, students should justify the appropriate policy to be followed. Depending on the time you have available, you may wish to choose some or all of the video clips to show. At the end of each clip, there are questions for discussion. Potential discussion points are outlined below.
* Scenario 1: Safeguarding policy should be followed. The patient has unexplained injuries and appears unduly agitated. This information should be shared with other healthcare workers so a full picture of the patient can be put together. Additional questions for discussion: Outline the potential legal, reputational, and ethical consequences for organisations that fail to protect individuals in their care; What essential skills do you think the healthcare practitioner used when communicating with the service user? What are the potential consequences of not communicating effectively with service users?
* Scenario 2: Note that in slide 5, there is a video which includes a sharps injury. Teachers should check this is suitable to use with their students before playing.
* If a healthcare practitioner is found to have not followed the correct health and safety policy, this could escalate to the disciplinary policy being followed to address this. Helen may also wish to follow the grievance policy to raise a concern / complaint against the workplace. (This could link to a discussion about the Health and Safety at Work Act 1974 which is introduced in Topic 4 lesson 7, so you may wish to relook at this scenario again then.)
* The video shows the main steps for the procedure (injury is immediately reported to supervisor, ensures Helen is safe, goes to occupational health, reports on internal system and then conducts an investigation). You may wish to discuss further the role of Occupational Health (e.g. bleeding of the injury, leaving uncovered, a follow-up to screen for infectious disease such as hepatitis B).
* The needle should have been disposed of in a sharps bin. Following the investigation, a member of staff was found to not be adhering to the local waste policy, which is also a health and safety issue, so further training of staff was found to be required. Risk assessment could also be discussed as well as central reporting of incident and risk score. Students could also discuss the relevance of the colour of the waste bags and the differences between these. Further information on suitable procedures following a sharps injury can be found in Appendix B on page 15 of this document: [www.solent.nhs.uk/media/1256/prevention-and-management-of-needlestick-sharps-injuries-and-contamination-incidents-policy.pdf](http://www.solent.nhs.uk/media/1256/prevention-and-management-of-needlestick-sharps-injuries-and-contamination-incidents-policy.pdf)
* Additional questions for discussion: Explain how employee fatigue could play a role in the incident of accidents at work and discuss how this could be mitigated; Explain what support services are available to employees who suffer trauma at work.
* Scenario 3: Equality policy should be followed. When the employee tells their employer they are pregnant, the employer must assess the risks to the employee and their baby (such as heavy lifting/carrying, standing or sitting for long periods without adequate breaks, exposure to toxic substances and long working hours). The employer must then take reasonable steps to remove the risks. For example, offering the employee different work or changing their hours. Additional questions for discussion: Explain what strategies organisations can employ to ensure that parental policies do not lead to indirect discrimination; Analyse the long-term effects of supportive parental policies on employee retention and job satisfaction.
* Scenario 4: Grievance policy should be followed. Everybody has the right to be treated respectfully in the workplace. If Amir did not follow the correct procedure, the issue should be explained and further training provided if required. Additional questions for discussion: Explain what types of evidence would need to be collected if a complaint was made; Analyse the potential consequences of unchecked bullying on the team dynamics. Outline the strategies organisations can implement to create an inclusive environment where employees feel comfortable reporting bullying incidents without fear of retaliation.
* Scenario 5: Safeguarding policy. It is essential that a risk assessment is carried out before an industry placement to ensure the safety of children, young people and adults including employees, customers and other personnel they come into contact with, including visitors. Additional questions for discussion: Explain who would have the main responsibility under law for the health and safety of the student; If there was a safeguarding incident during your industry placement, explain what process you would follow; How would this process differ (if at all) if the safeguarding concern was reported outside normal working hours?
 |
| **Plenary**SUGGESTED TIME: 5 minutesRESOURCES: * L1 Slide deck – slides 8–11
 | * Students answer two multiple choice questions in the slide deck with teacher support. (Answers are given in the slides.)
 |
| **Follow-up/consolidation**SUGGESTED TIME: 30–45 minutesRESOURCES: * L1 Slide deck – slide 12–13
* L1 Consolidation Worksheet
 | * As a follow-up, students revisit scenario 2 to explore what may happen after the incident. The injured employee has submitted a written grievance about the incident, which the employer must address. The employee is concerned that this accident could happen again but have more serious consequences.
* Students use information from the Health and Safety Executive to identify mistakes that have been made ([www.hse.gov.uk/biosafety/blood-borne-viruses/avoiding-sharps-injuries.htm](http://www.hse.gov.uk/biosafety/blood-borne-viruses/avoiding-sharps-injuries.htm))
* Students write a paragraph summarising the mistakes that have been made.
* If there is time, students could roleplay the meeting between the line manager and employee to resolve the situation.

Alternative consolidation activity:* Students should create a poster to summarise the purpose of the policies/procedures identified in this lesson.
 |

# Lesson 2: Audits, ethical practices and professional codes of conduct (A1.2, A1.3, A1.4)

This lesson provides students with an introduction to the importance of adhering to quality standards, quality management and audit processes, following professional codes of conduct, the key principles of ethical practice and the use of inclusion policies.

## Preparation

|  |  |
| --- | --- |
| **Resources provided** | * L2 Slide deck
* Plenary – L2 Plenary Worksheet 1, L2 Plenary Worksheet 2
 |
| **Equipment needed** | * College/school code of conduct
* Sticky tape/plasters
* Handwashing equipment
* Access to sink
 |
| **Safety factors** | None |
| **CLEAPSS references** | None |
| **Prior learning** | * Names and functions of organisational policies from lesson 1.
 |
| **Common misconceptions** | * Ethical beliefs are the same as religious beliefs.
* Policies and quality standards are the same thing.
 |
| **Accessibility** | * Seek to ensure wide representation for any visiting speakers and case studies used.
 |

## Activity guide

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| **Introduction**SUGGESTED TIME: 5–10 minutesRESOURCES: * L2 Slide deck – slides 2–4
 | * Start by introducing the lesson objectives using the slide deck.
* Use the slide deck to review the six key organisational policies and procedures using only their starting initials, for example, EDI (representing Equality, diversity and inclusion policy), for students to identify.
* Students could complete this as an individual written task or responses could be ascertained verbally.
 |
| **Activity 1: Quality standards and professional codes of conduct**SUGGESTED TIME: 35–45 minutesRESOURCES:* L2 Slide deck – slides 5–12
* College/school code of conduct
* Option 2:
* Access to a sink
* Handwashing equipment
* Food testing: pestle, mortar, test tube and test tube rack
* Microscope slide: microscope slide, cover slip, cotton swabs (normally sterile, but not necessary in a role-play), biological waste container to dispose of the swabs
* Chemical titration: Burette, burette stand, pipette, conical flask, safety goggles
 | * This activity provides a general introduction to the importance of adhering to quality standards, quality management and audit processes, and following professional codes of conduct. You may wish to explain that you are only offering a general introduction to these policies and approaches at this stage, and that each will be covered in more detail in later sections of the course, and during a student’s industry placement.
* Use the slide deck as a general introduction to quality standards; many students will be unaware of, for example, the British Standards Institute. Ask students to discuss why standardised measures of quality are important. These are summarised on the next slide.
* Discuss the similarities and differences between quality control and quality assurance. Explain that both processes may be achieved through the use of an audit. Ask students to discuss where they may have used audits previously. For example, many students will have used a learning checklist when revising for an exam to help ensure all content has been covered and can be used to highlight areas of learning that need further time and attention.
* Then, explain the importance of codes of conduct in helping to maintain quality standards. To introduce codes of conduct, in small groups, students could make a list of what they think is on their establishment’s code of conduct, for example, for attendance, type of clothing worn. They should then compare this with the real code of conduct and discuss why each step is important (this has links with the section below) in ensuring that a minimum standard of behaviour and good conduct is maintained.
* Film 1: Introduction to codes of conduct and ethics. Students can watch this film and answer the questions below. Teachers may choose to pause the video at the corresponding sections and ask students to provide a response or could ask the questions initially to gauge starting points before playing the film. Students may have some knowledge of codes of conduct from their industry placement or being in their provider that could be referenced and discussed here.

Questions* What is a code of conduct?
* Why are they important?
* What are ethics?
* Explore with students that all professional standards are equally relevant, such as uniform, appearance, attitude. Each standard has a link to the quality of service the organisation provides. You may wish to link these to students’ future placements (or past examples for those who have begun their industry placement or from previous work experience). This is an opportunity to ensure that students are aware of the code of conduct and expected behaviour on placement.
* There are two options to choose from for Activity 1, depending on which is appropriate for your students and the time constraints of the lesson.
* Option 1 (slide 10), Quality standards: Students watch this video clip of a science manufacturing technician, which describes their role in checking the quality of manufacture: [www.technicians.org.uk/roles/science-manufacturing-technician/](http://www.technicians.org.uk/roles/science-manufacturing-technician/)
* They should also read this case study resource from the Royal Society of Chemistry that describes the job of an individual who audits medicine suppliers to ensure they meet quality and safety standards: [edu.rsc.org/qualified-person-pharmaceuticals/4015783.articl](https://edu.rsc.org/qualified-person-pharmaceuticals/4015783.article)e
* Ask students to identify in these case studies the five reasons to adhere to the quality standards set out on slide 6.
* Option 2 (slide 11), Audits: Explain that students will now use an example of a real workplace audit to demonstrate their use in maintaining a standard. The example chosen is the NHS hand-washing audit, used to support patient and staff safety. This can be found on the Infection Prevention Control website here: [https://www.infectionpreventioncontrol.co.uk/resources/hand-hygiene-compliance-monthly-audit-tool-for-care-homes/](https://www.infectionpreventioncontrol.co.uk/resources/hand-hygiene-compliance-monthly-audit-tool-for-care-homes/%20)
* Show students the NHS video: [www.nhs.uk/live-well/best-way-to-wash-your-hands/](http://www.nhs.uk/live-well/best-way-to-wash-your-hands/). Discuss the importance of washing hands correctly in all practical settings within the health and science sectors.
* Split students into groups to complete a role-play activity, such as taking a food sample for food testing, preparing a microscope slide for looking at a cheek swab or performing a chemical titration. One student from each group will be asked to complete the hand hygiene audit, whilst watching the actions of other members of their group, and then feed back their findings. As the audit is based in a health care setting you may wish to discuss with the students when the key moments would be in a scientific setting, such as when entering / leaving the lab. There is not necessarily a need for students to have bare arms, but clothing should fit in a manner that it cannot interfere with any procedure being formed, such as dipping in chemicals. In the third example, handwashing is very important after the practical to ensure chemicals are not left in contact with the skin, rather than for biological contamination. Move the groups around the activities so each learner has a chance to complete the audit and at least one role-play.
* Discuss the handwashing data collected – is there room for improvement in approaches? Explain the role audits have in facilitating the maintenance of high standards and, where required, an improvement in skills. There should be at least 95% compliance within NHS trusts: [www.yorkhospitals.nhs.uk/seecmsfile/?id=871](http://www.yorkhospitals.nhs.uk/seecmsfile/?id=871) (page 4)
 |
| **Activity 2: Ethics**SUGGESTED TIME: 40 minutesRESOURCES:* L2 Slide deck – slide 13-14
 | * This activity provides an introduction to the importance of ethics covering the key ideas; this topic should then be revisited at appropriate points throughout the course.
* Hold a class discussion on what students believe is meant by ethical practice in the science sector. (Ethics will be studied in more detail later in the course).
* Film 2: Key terminology in ethical practice. Students can watch this film and answer the questions below. Teachers may choose to pause the video at the corresponding sections and ask students to provide a response. Students may have some knowledge of key terminology from undertaking the group discussion previously or from their industry placements.

Questions* Define autonomy, beneficence, nonmaleficence, justice, informed consent, truthfulness, confidentiality
* Provide an example in the health/ science sector for each term.
* To further support their understanding, ask students to explore a range of web-based materials that they identify to try to define the following key terms: beneficence; nonmaleficence; autonomy; informed consent; confidentiality; truthfulness; justice.
* You may also wish to provide a selection of links, e.g.:
	+ World Medical Association Declaration of Helsinki – Ethical Principles for Medical Research Involving Human Principles: [www.wma.net/policies-post/wma-declaration-of-helsinki-ethical-principles-for-medical-research-involving-human-subjects](http://www.wma.net/policies-post/wma-declaration-of-helsinki-ethical-principles-for-medical-research-involving-human-subjects)
	+ University research ethics policies (e.g. Manchester): [www.manchester.ac.uk/research/environment/governance/ethics](http://www.manchester.ac.uk/research/environment/governance/ethics) and: [documents.manchester.ac.uk/display.aspx?DocID=28798](https://documents.manchester.ac.uk/display.aspx?DocID=28798)
	+ Universal ethical code for scientists: [www.gov.uk/government/publications/universal-ethical-code-for-scientists](http://www.gov.uk/government/publications/universal-ethical-code-for-scientists)
	+ BMA toolkit for medical students: [www.bma.org.uk/advice-and-support/ethics/medical-students/ethics-toolkit-for-medical-students/key-principles-of-ethics-for-medical-students](http://www.bma.org.uk/advice-and-support/ethics/medical-students/ethics-toolkit-for-medical-students/key-principles-of-ethics-for-medical-students)
	+ Nursing and Midwifery Council Code: [www.nmc.org.uk/standards/code](http://www.nmc.org.uk/standards/code)
	+ NHS values and constitution: [www.healthcareers.nhs.uk/working-health/working-nhs/nhs-constitution](http://www.healthcareers.nhs.uk/working-health/working-nhs/nhs-constitution)
* As these are new key terms, you may wish to stop students at different points to discuss what they have found and to provide further clarification.
 |
| **Plenary**SUGGESTED TIME:10–15 minutesRESOURCES: * L2 Slide deck – slide 15
* L2 Plenary Worksheet 1
* L2 Plenary Worksheet 2
 | * This activity tests students’ understanding of some of the key terms used in ethical practice. It is designed so that students have a complete set of standard definitions for their notes.
* There are two versions of this task depending on the time you have available. In version A, students complete an activity where they match the key term to a definition, and an example of its use in ethical practice. In version B, students match the definitions to the key terms and then carry out some research to add their own example of its use in ethical practice. Time then needs to be allowed for students to share their examples to ensure they all have a complete list.
 |
| **Follow-up/consolidation**SUGGESTED TIME:15–20 minutesRESOURCES:* L2 Slide deck – slides 16–17
 | * As a follow-up piece of work to reinforce some of the ideas from this lesson, ask students to read the following examples of professional codes of conduct and explain how these help to ensure a fair and safe workplace for employees:
	+ <https://www.rsc.org/globalassets/03-membership-community/join-us/membership-regulations/rsc-code-of-conduct-final.pdf> <https://www.rsc.org/globalassets/03-membership-community/join-us/membership-regulations/royal-society-of-chemistry-guide-to-ethics.pdf>
	+ <https://wellcome.org/grant-funding/guidance/responsible-conduct-research>
* Students could also use/ revisit any of the codes of conducts listed in activity 2.
 |

# Lesson 3: Opportunities for progression in the health and science sectors (A1.5, A1.6)

This lesson introduces students to the diverse range and classifications of occupations available in the science sectors. It is intended to be delivered near the start of the course to support students’ awareness of progression pathways they may wish to pursue.

## Preparation

|  |  |
| --- | --- |
| **Resources provided** | * L3 Slide deck
* Activity 3 – L3 Activity 3 Worksheet
* Activity 4 – L3 Activity 4 Worksheet
 |
| **Equipment needed** | None |
| **Safety factors** | None |
| **CLEAPSS references** | None |
| **Prior learning** | * CV writing is covered in schools in Key Stage 4 but will not necessarily have been met yet during students’ study programmes.
 |
| **Common misconceptions** | * Science-based roles are all professional occupations; technician roles are limited.
* Perceptions of roles – for example, all science occupations are based in a laboratory; pharmacists just give out medicines prescribed by a doctor; people who work in healthcare are carers, doctors and nurses, with no science occupations in this field; the only science involved in healthcare is biology.
 |
| **Accessibility** | * Seek to ensure wide representation for any visiting speakers and case studies used.
* Support visiting speakers to provide appropriate levels of detail to prevent reinforcing the impression amongst some students that ‘healthcare is not for me’.
 |

## Activity guide

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| --- | --- |
| **Introduction**SUGGESTED TIME: 5 minutesRESOURCES: * L3 Slide deck – slides 2–3
 | * Start by introducing the lesson objectives using the slide deck.
* Give students one minute to list as many occupations as they can that use science. Compile a class list from their ideas.
* Discuss how many of the occupations suggested are the same – how broad is the range of occupations? How do students know about these occupations?
 |
| **Activity 1: Occupations within the science sector**SUGGESTED TIME:15–20 minutesRESOURCES:* L3 Slide deck – slides 4–7
 | * This activity aims to dispel some of the misconceptions around the lack of diversity of roles within science and is an opportunity to discuss the breadth of entry points to science-related careers.
* Use the slide deck to show students a range of video clips of people from different roles in science organisations, where they describe some of the key features of their role. There are a number of options to choose from on the slides, and a link to further options on the ‘Technicians: we make the difference’ website: [www.technicians.org.uk/technician-profiles/browse-the-roles](http://www.technicians.org.uk/technician-profiles/browse-the-roles)
* Whilst watching the clips, students should note the key features of each role (and, where mentioned, the variety of education and training paths they could follow to prepare for a position, including progression directly into employment via apprenticeships, higher technical education, or undergraduate study).
* Discuss with students if they had thought of these roles previously. Are there any more examples they could now add to the class list?
* If opportunities exist, you may wish to invite individuals working in some different roles to talk with students directly.
 |
| **Activity 2: Types of occupation**SUGGESTED TIME: 15–20 minutesRESOURCES:* L3 Slide deck – slides 8–9
 | * This activity introduces the differences between technical, higher technical and professional occupations in science and explores a number of different ways in which people can train for roles in science.
* Introduce the three classifications of occupations in science – technical, higher technical and professional – and the typical level of qualifications required for entry.
* Students look at occupational route maps: [www.instituteforapprenticeships.org/occupational-maps/](http://www.instituteforapprenticeships.org/occupational-maps/) that include some of the jobs covered in the video clips. Students should be aware that there may be multiple paths to an occupation, and that the Science occupational map will not include all the occupations that they may choose to progress to. (Please note the maps only show occupations with apprenticeships and full information for occupations with apprenticeships is only available for those with a developed apprenticeship standard. This will hopefully be added to over time.)
* This illustrates further the different classification of occupations and a range of next steps students may wish to follow.
* Students then identify roles within the sector they may wish to pursue and create their own personalised route map into these roles. Are there any barriers they may meet? Students may find the ‘Technicians: we make the difference’ website helpful: [www.technicians.org.uk](http://www.technicians.org.uk) and also the National Careers Service site: [nationalcareers.service.gov.uk/job-categories/science-and-research](https://nationalcareers.service.gov.uk/job-categories/science-and-research), as it lists a range of careers in science, with an overview of what the role involves, the entry requirements and skills and personal qualities needed.
* Even though they are not designed for a student audience, you may wish to view progression profiles to gain an outline of career pathways: <https://www.instituteforapprenticeships.org/media/7058/t-level-in-science-progression-profile.pdf>
* Teachers may choose to use labour market intelligence to support this activity to determine the scope of occupations in their local area.
 |
| **Activity 3: Classifying occupations**SUGGESTED TIME:10–15 minutesRESOURCES:* L3 Slide deck – slides 10–11
* L3 Activity 3 Worksheet
 | * This activity tests students’ understanding of the difference between technical, higher technical and professional occupations.
* Students complete the card sort activity on the worksheet to sort a range of science-based occupations into technical, higher technical or professional occupations. They may wish to refer to the occupational route maps mentioned above.
* In their notes, you may wish students to write a brief description of the differences between the three classifications of occupation and use their cards to list a few examples of each.
 |
| **Activity 4: Career action plan**SUGGESTED TIME:20–25 minutesRESOURCES: * L3 Slide deck – slides 12–14
* L3 Activity 4 Worksheet
 | * In this activity, students look at things they can do alongside their studies to boost their preparation for their potential career.
* Using the slide deck, students carry out some research into things they could do to boost their employment opportunities in the future by creating an action plan, including volunteering, virtual work experience and additional courses they could complete alongside their studies. (Please note some of the websites, such as IRIS, could be shown to assess the appetite for the college registering with the site for students to use.)
* Students complete the worksheet, which is a short action plan of what they personally need to work on (skills and qualifications) to progress into their potential career.
 |
| **Plenary**SUGGESTED TIME:10 minutesRESOURCES: * L3 Slide deck – slides 15–16
 | * Students complete a study question to test their understanding of jobs that require the application of science in other industries.
* Then they swap their answers and mark their partner’s response using the mark scheme provided.
 |
| **Follow-up/consolidation**SUGGESTED TIME:30–45 minutesRESOURCES:* L3 Slide deck – slides 17–18
 | * To further help dispel some of the misconceptions around the lack of diversity of roles within science, students could look at the following articles:
* Science fiction: common misconceptions about science jobs: [news.hyperec.com/post/science-fiction-common-misconceptions-about-science-jobs](https://news.hyperec.com/post/science-fiction-common-misconceptions-about-science-jobs)
* Only for academics? Five myths about science and technology: [www.theguardian.com/careers/five-myths-science-technology-maths-stem-careers](http://www.theguardian.com/careers/five-myths-science-technology-maths-stem-careers)
* Students then myth bust in a quick round Q&A session to correct a common misconception, such as all scientists work in a laboratory or you need a degree to be a scientist.
 |

# Lesson 4: Diversity of roles within organisations and the science sector in general (A2.1, A2.2, A2.3)

This lesson introduces students to the structure of an organisation using the case study of the pharmaceutical industry. Different job roles collaborate to support the many aspects of the development of a new medicine. Some of these jobs are instantly recognisable as science roles. There are many other support roles relating to regulatory compliance that
T Level science students could progress to. Other industry sectors could be referred to, such as biosciences, chemicals, petroleum, electronics and engineering.

## Preparation

|  |  |
| --- | --- |
| **Resources provided** | * L4 Slide deck
* Activity 1 – L4 Activity 1 Worksheet 1, L4 Activity 1 Worksheet 2
* Activity 2 – L4 Activity 2 Worksheet
* Consolidation – L4 Consolidation Worksheet
 |
| **Equipment needed** | None |
| **Safety factors** | None |
| **CLEAPSS references** | None |
| **Prior learning** | * Students should be familiar with a range of science careers from their study in lesson 3, as well as the difference between technical, higher technical and professional occupations.
* Students will be familiar with using a range of common laboratory apparatus from their practical work during Key stage 4.
 |
| **Common misconceptions** | * All scientists work in a laboratory – there are many different types of practical work; these include traditional ‘wet’ practicals and ‘dry’ practicals such as data analysis.
* Science is a solitary industry – many industries/companies work together, for example, the international research on Covid-19 vaccines.
* You need very high levels of qualifications for a career in science.
* Science is not a creative process – thinking creatively is often a key feature of research.
 |
| **Accessibility** | * Seek to ensure wide representation for any visiting speakers and case studies used.
* All of society is represented in STEM careers. To illustrate this, you may wish to celebrate diversity by looking at individuals from different backgrounds with careers in science. This could be by looking at different contemporary case studies for each topic/term, including addressing stereotypes and bias – everyone has different inputs to offer, for example: [peoplelikeus.io/meet-the-people](https://peoplelikeus.io/meet-the-people)
 |

## Activity guide

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| --- | --- |
| **Introduction**SUGGESTED TIME: 15 minutesRESOURCES: * L4 Slide deck – slides 2–9
 | * Start by introducing the lesson objectives using the slide deck.
* Students consider which employer would have a more diverse range of occupations across their organisation and why.
* Use students’ ideas to hold a brief discussion on the factors that contribute to the diversity of employers and work carried out in the science sector. Although slide 3 focuses on the diversity of roles in pharmaceutical companies, you may choose to use other companies and scientific contexts in the discussion to illustrate diversity. For example, the chemical industry is a large UK employer of STEM skilled workers, as are the utility companies.
* The key factors students need to be aware of are listed on slide 4.
* Further information about each factor is given on the slide deck.
 |
| **Activity 1: Development of a medicine**SUGGESTED TIME:30 minutesRESOURCES:* L5 Slide deck – slides 10–13
* L4 Activity 1 Worksheet 1
* L4 Activity 1 Worksheet 2
* L4 Activity 1 –QR codes
 | * This activity illustrates the diversity of work and careers in science through the example of how a new medicine is developed. (It also offers an opportunity to revisit the importance of adhering to quality standards, quality management and audit processes by identifying these processes in particular job roles.)
* Students complete a matching activity on Worksheet 1 to sequence the main steps involved in the production of a new medicine (answers are on Worksheet 2).
* Students then carry out a carousel activity to discover that not all jobs in the pharmaceutical industry are related to research and development. The British Pharmaceutical Industry (ABPI) groups these disciplines into four areas: research and development, manufacturing and supply, commercial, and support function.
* Place the QR codes (cut from L4 Activity 1 – QR codes) around the room and allow students to scan them with a mobile device to find out more about the types of careers that work together in each of these fields. Students record their findings into the table on Worksheet 1.

Further sources of information that could be included at each point:* + Research and Development – <https://www.getreskilled.com/types-of-pharma-jobs/#R&D>
	+ Manufacturing and supply – <https://www.rpharms.com/resources/careers-information/career-options-in-pharmacy/industrial-pharmacy>
	+ Commercial – <https://www.coursera.org/articles/pharmaceutical-sales-jobs>
	+ Support function – <https://www.abpi.org.uk/careers/working-in-the-industry/support-functions/>
* Ask students to share their findings and question them about the role of some disciplines in each sector. (Sample answers provided on slide 13)
 |
| **Activity 2: Large organisations**SUGGESTED TIME:30 minutesRESOURCES:* L4 Slide deck – slide 14
* L4 Activity 2 Worksheet
 | * This activity reinforces students’ understanding of the diversity of science-related jobs undertaken within a large organisation by looking at Novartis, a pharmaceutical organisation.
* Students read through information on the worksheet and also on the Novartis website, before compiling a fact file about the company.
* Discuss their findings: what type of company is Novartis?
* Students then carry out research on careers at Novartis to create a mind map.
* You may wish to link this case study to the work covered in lesson 1 on organisational policies, for example, through students looking at Novartis’ Code of Ethics. To learn more about the company’s diversity, equity and inclusion policies students can access this link: [www.novartis.com/about/diversity-equity-inclusion](http://www.novartis.com/about/diversity-equity-inclusion)
 |
| **Plenary**SUGGESTED TIME: 15 minutesRESOURCES: * L4 Slide deck – slides 15–16
 | * Students answer the study question on the slide deck.
 |
| **Follow-up/consolidation**SUGGESTED TIME:30–45 minutesRESOURCES:* L4 Slide deck – slide 17
* L4 Activity Consolidation Worksheet
 | * Students begin to gather some additional research into a job of their choice in the pharmaceutical industry, using the worksheet.
* They will complete this in lesson 5 and share their findings with the class.
* Alternatively, students investigate a scientific company of their choice and research the range of roles that are available, capturing the key purpose of the company and a brief description of the different jobs they identified.
 |

# Lesson 5: The role of laboratory technicians in the science sector (A1.4, A2.1, A2.2)

In this lesson, students will undertake practical work to highlight the role and importance of laboratory technicians in the science sector. They will also answer a summary question to consolidate their understanding of the topic.

## Preparation

|  |  |
| --- | --- |
| **Resources provided** | * L5 Slide deck
* Activity 2 – L5 Activity 2 Worksheet 1, L5 Activity 2 Worksheet 2
 |
| **Equipment needed** | Equipment required depends on the practical chosen – see the CLEAPSS resources. Note: these are only accessible by CLEAPSS members. |
| **Safety factors** | Teachers and students are required to carry out their own risk assessments. These are given as a guide. |
| **CLEAPSS references** | * [science.cleapss.org.uk/resource-info/pp050-investigating-the-effects-of-antimicrobial-chemicals.aspx](https://science.cleapss.org.uk/resource-info/pp050-investigating-the-effects-of-antimicrobial-chemicals.aspx)
* [science.cleapss.org.uk/resource-info/pp085-using-colorimetry-to-quantify-reducing-sugar-concentrations.aspx](https://science.cleapss.org.uk/resource-info/pp085-using-colorimetry-to-quantify-reducing-sugar-concentrations.aspx)
* [science.cleapss.org.uk/resource-info/pp102-making-blood-smear-slides.aspx](https://science.cleapss.org.uk/resource-info/pp102-making-blood-smear-slides.aspx)

Providers need to be a member of CLEAPSS to access these materials; further details are available at [www.cleapss.org.uk](https://emea01.safelinks.protection.outlook.com/?url=http%3A%2F%2Fwww.cleapss.org.uk%2F&data=05%7C01%7C%7C02ffa25b087d49539aa008dbc588dc6e%7C84df9e7fe9f640afb435aaaaaaaaaaaa%7C1%7C0%7C638320963853850837%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C3000%7C%7C%7C&sdata=Tli3f%2BMAu4cnou49aNpzy3NRTcWOVoY0P3uZK14%2BPQ0%3D&reserved=0) |
| **Prior learning** | * Students should be familiar with the diversity of roles in organisations and the science sector from lesson 4.
 |
| **Common misconceptions** | * See lesson 4.
 |
| **Accessibility** | * Seek to ensure wide representation for any visiting speakers and case studies used.
* See lesson 4.
* Note that the CLEAPSS technician sheets are not written for student use. You may need to check and modify them if necessary to meet the needs of your students.
 |

## Activity guide

|  |  |
| --- | --- |
| **Introduction**SUGGESTED TIME: 10 minutesRESOURCES: * L5 Slide deck – slides 2–10
 | * Start by introducing the lesson objectives using the slide deck.
* This introductory activity consists of four short-answer questions that relate to previous lessons. Each lesson offers an opportunity to explain the question in greater depth for discussion in class.
* The final question leads into the next activity which looks at the organisational structure of a pharmaceutical company.
 |
| **Activity 1: The role of laboratory technicians**SUGGESTED TIME:45–60 minutesRESOURCES:* L5 Slide deck – slides 11–13
* Equipment required depends on activity chosen
 | * To highlight the important role laboratory technicians play in the science sector, students complete a CLEAPSS practical. This is also an opportunity to review with students the breadth of science-related technician roles they have come across during this topic, to reinforce the breadth and challenge the stereotype of ‘technician’ roles.
* Before beginning the practical, discuss with students the important role laboratory technicians play in the science sector. They typically have the following roles:
1. to prepare equipment and materials used in practicals. For example, by ensuring health and safety regulations are met for all aspects of the laboratory, ensuring there are appropriate stocks of consumables and equipment, and calibrating machinery.
2. to carry out various kinds of experiment and scientific test. For example, collecting and preparing samples for testing, performing standard tests and recording results.
* You may wish to share with the students the technician sheets that accompany the CLEAPSS practicals. These have not been written for student use, so you may need to check and modify them if necessary to suit your students.
* The slide deck contains links to three CLEAPSS practicals for you to choose from, although you may wish to choose a metrology-based practical to provide students with a wider range of practicals a laboratory technician could undertake. Alternatively, you may wish to choose the practical that students complete depending on a skill you wish students to practice or develop, and on the time you have available.
 |
| **Activity 2: Study question**SUGGESTED TIME:20 minutesRESOURCES:* L5 Slide deck – slide 14
* L5 Activity 2 Worksheet 1
* L5 Activity 2 Worksheet 2
 | * Students complete a study question on Worksheet 1 to test their understanding of the diversity of work carried out within the science sector and the factors that contribute to the diversity of an organisation. Note: This is a challenging question so includes some help points. These can be removed if you prefer.
* Then they swap their answers with partner and peer mark using the mark scheme on Worksheet 2.
 |
| **Plenary**SUGGESTED TIME:10 minutes | * Students provide feedback on the study question and update their notes to capture points they need to review.
 |
| **Follow-up/consolidation**SUGGESTED TIME:30–45 minutesRESOURCES:* L5 Slide deck – slide 15
 | * Students identify a science technician role that may not be well known and research the education and training pathways they could take towards this.
 |

Weblinks and resources

All weblinks and resources have been used in accordance with the owner Terms and Conditions, and where specified, permission has been granted by the owner.

Inclusion of web links or mention of external organisations within the teaching materials does not imply any affiliation with, endorsement by or sponsorship of these external organisations.

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| --- | --- | --- | --- |
| Location | Link (with permission if required) | Owner | Date last accessed |
| Teaching Guide page 2 | [www.ncfe.org.uk/qualification-search/qualification-detail/t-level-technical-qualification-in-science-level-3-delivered-by-ncfe-883](http://www.ncfe.org.uk/qualification-search/qualification-detail/t-level-technical-qualification-in-science-level-3-delivered-by-ncfe-883) | NCFE International | January 2024 |
| Teaching Guide page 3 | [www.technicaleducationnetworks.org.uk](http://www.technicaleducationnetworks.org.uk/) | Technical Education Networks | January 2024 |
| Teaching Guide page 5 | support.tlevels.gov.uk/hc/en-gb/articles/360015345420-Industry-placement-logbook-for-students  | GOV UK | January 2024 |
| Teaching Guide page 6, 22 / Lesson 3 Slide 9 | [nationalcareers.service.gov.uk/job-categories/science-and-research](https://nationalcareers.service.gov.uk/job-categories/science-and-research) | GOV UK | January 2024 |
| Teaching Guide page 6 | [www.rsb.org.uk](http://www.rsb.org.uk) | Royal Society of Biology | January 2024 |
| Teaching Guide page 6 | [www.iop.org/](http://www.iop.org/) | Institute of Physics | January 2024 |
| Teaching Guide page 6 | [www.rsc.org/](http://www.rsc.org/) | Royal Society of Chemistry | January 2024 |
| Teaching Guide page 6 | [www.the-ies.org](http://www.the-ies.org) | Institution of Environmental Sciences | January 2024 |
| Teaching Guide page 6 | [istonline.org.uk/](https://istonline.org.uk/) | Institute of Science and Technology | January 2024 |
| Teaching Guide page 6 | [www.hcpc-uk.org/](http://www.hcpc-uk.org/) | Health and Care Professions Council | January 2024 |
| Teaching Guide page 7 | [sciencecouncil.org/professional-bodies/](https://sciencecouncil.org/professional-bodies/) | Science Council | January 2024 |
| Teaching Guide page 14 | [www.solent.nhs.uk/media/1256/prevention-and-management-of-needlestick-sharps-injuries-and-contamination-incidents-policy.pdf](http://www.solent.nhs.uk/media/1256/prevention-and-management-of-needlestick-sharps-injuries-and-contamination-incidents-policy.pdf) | Solent NHS Trust | January 2024 |
| Teaching Guide page 15 / Lesson 1 Slide 12 | [www.hse.gov.uk/biosafety/blood-borne-viruses/avoiding-sharps-injuries.htm](http://www.hse.gov.uk/biosafety/blood-borne-viruses/avoiding-sharps-injuries.htm) | Health and Safety Executive | January 2024 |
| Teaching Guide page 17 / Lesson 2 Slide 11 | [www.technicians.org.uk/roles/science-manufacturing-technician/](http://www.technicians.org.uk/roles/science-manufacturing-technician/) | Technicians | January 2024 |
| Teaching Guide page 18 / Lesson 2 Slide 11 | [edu.rsc.org/qualified-person-pharmaceuticals/4015783.articl](https://edu.rsc.org/qualified-person-pharmaceuticals/4015783.article)e  | Royal Society of Chemistry | January 2024 |
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