**Science: pre-placement learning plan**

These pre-placement activities are linked to the T Level curriculum and to employers’ expectations of what students should be able to do when they start the placement. Links are given to useful resources which contain examples of what to include in the activities

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| Purpose | Activity | Links |
| Develop good scientific discipline | Undertake a research activity and mini project on the principles of good science discipline based on the themes of good manufacturing processes (GMP) GMP in medicine manufacture and production.  The key outcome is to better understand the need for:   * Consistent application of processes * Following standard operating procedures and formulae * Accuracy of measurement, timing, and recording   The activity will also identify the student’s aptitude and potential for scientific working. | <https://www.who.int/news-room/questions-and-answers/item/medicines-good-manufacturing-processes>  <https://safetyculture.com/topics/gmp/>  <https://www.gov.uk/guidance/good-manufacturing-practice-and-good-distribution-practice> |
| Use a computer and the main software packages competently | Science uses several software applications including:   * Spreadsheets * Visualisation (Visio/SmartDraw) * Data handling and transfer * Internet research in the academic environment (scholarly research).   Students can be set projects to analyse data, find literature and use sources to complete paragraphs of analysis, reporting or topic-led essay writing. | Most software applications offer limited access for free, trial applications and licences for academic use |
| Develop analytical thinking skills | Students can be set a problem to solve, or a practical task to undertake that develops the core disciplines of analytical thinking:  Observation   1. Analysis 2. Identifying bias 3. Inference 4. Problem solving 5. Curiosity   Students can use these disciplines to:   * Identify a problem * Clarify the problem (reframe) * Come up with ideas to solve it * Develop and implement their ideas * Evaluate outcomes |  |
| Develop critical thinking skills | Critical thinking can improve the application of scientific discipline in that it:   * Encourages deeper, more productive discussions * Facilitates open communication between team members * Resolves issues between team members and stakeholders more quickly * Develops better solutions to problems * Reduces stress throughout a project * Prevents repetitive issues * Achieves better results faster   Examples of problems could include:   1. Crime scene investigation puzzles 2. Data analysis problem (how to identify what’s going on) 3. Calculations and options puzzles (escape room) 4. Online apps and software |  |
| Know how to be thorough and pay attention to detail | This is a key discipline and can be practised using experiments, calculations and the preparation of materials and resources. Activities can include:   * Researching specific science topics * Undertaking measurements and calculations * Recording information | <https://www.testgorilla.com/blog/importance-attention-to-detail/>  <https://uk.indeed.com/career-advice/career-development/attention-to-detail>  <https://www.careeraddict.com/develop-your-attention-to-detail-skills> |
| Develop the ability to use initiative | Initiative and command tasks such as the ones shown in the links highlight important team processes and give students the chance to apply their skills in practical situations. | <https://teamcraft.com/team-building/ropes-challenge-programs/team-initiatives-program/team-initiative-activities/>  https://www.experientiallearning.org/blog/43-command-tasks-for-cadets-and-teen-leadership-activities/ |
| Develop the ability to work well with others | Small group tasks are also good for developing teamwork skills, especially where students rotate roles including:   * Group leader * Timekeeper/rules lead * Outcomes recorder * Diarist * Operations (as many as needed)   Tasks can include conceptualisation, design, and build stages, for example:   * Design a new soft drink campaign * Come up with ideas for an app and develop it * Plan a party or a social event * Plan a day trip or outing * Design and market test a new gadget | <https://ventureteambuilding.co.uk/team-building-activities/>  https://www.surfoffice.com/blog/teambuilding-activities-work |
| Develop thinking and reasoning skills | Codebreaking and problem-solving are an excellent starting point for developing these skills. Activities could include:   * Presenting students with data sets from a range of experiments and asking them to deduce the answer * Presenting students with the solution to a complex problem and asking them to identify the steps used to elucidate them | <https://simonsingh.net/books/recommended-books/great-cryptography-books/> |