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**TSST COURSE AUDIT FORM**

**This form is designed to allow community based panels of teachers to evaluate each other's course, facilitated by the Institute of Physics.**

**Courses which meet the required standard will be deemed to have received IOP-enabled community approval.**

**Evaluators will be primarily looking at consistency between course objectives/outcomes and mode of delivery. The audit form is designed to test the coherence of the course as described. Individual courses may vary in length and it is for individual participants to decide which advertised length suits their needs best.**

**However, based on community feedback, it was felt that it would be helpful to provide some guidance as to specific aspects. Most specific recommendations are given in the Notes columns. In addition it was felt that a TSST course securing IOP approval would normally be expected to take 30-50 hours to complete, excluding unmonitored independent learning time. Please note that a course submitted for auditing will not be penalised if it does not meet a stated guideline. However, the approval panel will expect to see some justification.**

**Institute of Physics will publish details of all community approved courses on the IOP website.**

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| **Name of lead school** | Walton High School |
| **Lead contact** | Jo Rowley |
| **Date submitted** | September 2018 |

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| **Course summary** | **Notes** |
| The course will follow the successful format from the previous year. The programme will focus on the content for the new 9-1 GCSE. Across five face-to-face days, it will cover the following key topics: energy, motion and forces (including an introduction to mechanics), waves and vibration, electricity, magnetism and fields and matter and cosmology.The target participant group will be non-specialist Physics teachers, currently or intending to teach Physics. These could be teaching any discipline currently. During this year of running, delivery will be by an outstanding practitioner at the lead school, with the potential to work/affiliate with Keele University in the future.By the end of the course, participants would be expected to have a solid understanding of the GCSE course which would enable them to teach to a GCSE standard. There will also be opportunity for participants to gain an understanding of some aspects of A level Physics which will enable them to cement their knowledge of GCSE and enable them to stretch and challenge their future GCSE groups.The participants will have a mentor who will be available throughout the year to provide advice, ideas and support. This mentor will also monitor the pre session tasks that each participant has to complete. | Short description of the course (e.g. objectives and expected outcomes) |

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|   | **Subject area (indicate number of hours)** |
| **Mode of delivery** | Energy | Motion & Forces | Waves | Electricity & electromagnetism | Matter & Space | Other, if any, specified below: |
| Face to Face (Presentations, lectures, guided group tutorial work with tutor present) |  3 | 3 | 3 | 3  | 3 |    |
| Practical (Hands on use of apparatus working individually or small groups. Observation of demonstrations is not deemed to be practical work) |  2 | 2  | 2  |  2 |  2 |    |
| Coaching/ Mentoring (One to one or small group sessions involving coaching, mentoring or allied techniques led by an experienced practitioner.) |   |   |   |   |   |   2 hours – physics lesson observation and feedback (plus planning time)Varying amount of time – Participants also have unlimited access to their mentor who will advise and support with Physics lessons and ideas. |
| Monitored independent learning (e.g. online tutorial work) |  1This is a pre session task which is completed by each participant. They have access to their mentor if they are struggling or need support. | 1  | 1  | 1  | 1  | 1 hour per session (5 hours) – During each session participants are given extra support questions to complete. 1 hour per session (5 hours) – participants will be expected to plan activities that could be incorporated into lessons or design resources that could be used. These will be shared with the group each session. |
| Other modes (please specify below) |   |   |   |   |   |  Lesson observations – there will be the opportunity for candidates to observe outstanding Physics practitioners at Walton High School. Depending on current work commitments, this could be any range of time from 1 lesson to a week of observations. |
| **Total hours** | 6 | 6 | 6 | 6 | 6 | Total – 42 + additional mentoring hours and observation opportunities |

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| **Please provide further *brief* detail on the following aspects of the course** | **Notes** |  |
| **Practical Work** | Specify what nature is – e.g. embedded in related session/standalone/skills focussed, work in pairs/groups. Also include Health and Safety measures in place.  |
| At the start of the course, general lab health and safety guidelines will be covered. During each of the face-to-face sessions specific practical activities will be outlined which will be relevant to the particular topics being covered. Participants will be able to test practical activities individually to assess any potential mistakes pupils may make when carrying out practical work. This will give participants ideas for delivering practical style Physics lessons and the confidence to safely run a lab.Additionally, there will be a focus on the GCSE required practical’s which relate to each topic. Every required practical for the new GCSE will be covered during face-to-faces sessions with participants able to attempt all experiments. In addition to this, there will be the option for participants to take part in some of A level required practical work. This will be extension for those participants who need it. Health and safety procedures for each specific practical will be outlined and candidates will be provided with CLEAPPs protocols.  |
| **Subject knowledge** | Please give more details on methodology of subject knowledge (e.g. lecture, practice questions, peer tutorial, diagnostic testing) |
| Prior to each face-to-face day, participants will be expected to complete a diagnosis test for the particular topic. The lead teacher will receive these results prior to the face-to-face session and this will help to inform planning of that session. This will allow differentiation of tasks to be built in to the days. This will include additional support for non-science specialists with a key focus on managing a lab and lab safety. For participants who are familiar with a lab environment, there will be opportunities for extension for example practicing A level practical work. During the face-to-face days, a subject specialist will deliver lecture style sessions interspersed with: * Practical work with the intention of participants gaining the skills to teach practical lessons.
* Focus on specific required practical’s including science skills required by pupils.
* Practice exam style questions with a focus on the level of maths required in the new GCSE.

During each session, participants will be provided with a complete set of notes for each session with many useful classroom resources too. This will be given out as hard copies and also uploaded to the Canvas platform.After each session participants will be expected to complete activities and problems based on the content of the session. Their mentor will be available to support with this if needed. This will be monitored through the mentor and also at the next face-to-face session. This will allow them to reflect on the content of each session and allow for support.On top of this, all participants will have access to the entire of the A level required practical booklets. This will allow them to attempt to work through the theory and calculations at home before attempting experiments on the face-to-face days after completion of GCSE work. This is optional and there to support those participants who may be teaching A level Physics in the future. |
| **Pedagogical Content Knowledge** | Give further details on methodology used (e.g. pupils, misconceptions/naïve conceptions) |
| The programme is intended to strengthen and develop participants own scientific and mathematical knowledge, focusing not just on surface learning but developing a deep understanding to enable them to better deliver this material to pupils. During each face-to-face session, there will be a variety of different activities which will address all areas of the GCSE Physics curriculum. There will be some teacher lead time where content will be explained, followed by small activities where participants will have chance to observe misconceptions for themselves. Time will be built into the days to discuss misconceptions/mistakes that the participants made and the lead teacher will be able to compare this to misconceptions that the pupils have. Concept cartoons will be used to address some of these common areas for misconceptions.Participants will apply the knowledge they learn through practical work, allowing for a chance for them to observe any potential mistakes pupils may make, or any areas of the practical they may find challenging. Then ideas for teaching these particular topics will be shared. At this point common misconceptions that pupils have will also be discussed.  |
| **Research Informed Practice** | How do you propose to embed the results of research informed best practice (e.g. access to research articles)  |
| Participants will be directed to the following resources:* IOP – which has detailed resources for teaching A level Physics and the new assessed practical’s (with a particularly useful section which details what pupils will already know for each topic), ideas for teaching specific GCSE topics including practical advice, interesting ideas for extracurricular activities eg. Looking at exoplanets and literature on a number of issues within physics teaching.
* Talk physics <https://www.talkphysics.org/> which has articles including the latest news, groups and forums to ask questions and provide support to others.
* Supporting Physics Teaching <http://supportingphysicsteaching.net/> which is a teaching resources for specialist and non-specialist physics teachers, including sections on misconceptions pupils may have within specific topics and guidance on how to deal with these issues.

Articles/pages of interest will be emailed to the participants regularly throughout the course. Participants should keep up with this reading in their own time and add their most useful articles to their workbook. |
| **Handling of Mathematical Requirements** | e.g. handling of graphical techniques, proportionality, errors |
| The mathematical requirements will be taught alongside the practical skills work. Rather than dedicating time specifically to mathematical requirements, this will be combined with the teaching of other topics and discussed when relevant. For example, changing the subject of an equation will be covered when teaching gravitational potential and kinetic energy equations. At Walton High School, mathematical skills are taught throughout the 5 year GCSE course and reinforced regularly. This is also the intention throughout the TSST course. f |
| **Participant Assessment Arrangements** | Use of various modes e.g. lesson observation, portfolio, diagnostic testing, etc.  |
| Prior to each session, participants will complete a diagnostic test to determine initial knowledge and understanding of the topics. This information will be used by the lead teacher to inform planning of each session and also allow for individuals to have specific support or extension tasks during each of the face-to-face days. Participants will use these tests, along with assignments from the face-to-face days to form a work book. The progress made though the work book will be monitored during the face-to-face sessions.After each face-to-face session, participants will be expected to update their workbook which will include the notes from the session, all resources that are provided and any problems/questions they solved throughout the day. There will also be additional problems the participants are expected to work through at home and bring to the next session. These tasks will be assessed by the lead teacher and feedback will be given to each participant. Between sessions, participants will also be expected to plan lessons/activities based on each session and produce resources which can be shared with the rest of the group. Again, their mentor will be available between sessions for support and inspiration.Together, the diagnostic tests and the post session tasks will show participant progress through the course and this will be monitored by the participants mentor.At the end of the five face-to-face sessions, participants will complete a final assessment to evaluate their progress. Participants will also have a Physics lesson observation. They will receive subject specific feedback for this observation.On completion, participants will receive a certificate stating what they have completed throughout the duration of the course. |
| **Quality Assurance Mechanisms** | Mention use of any form of quality assurance – use of validated material, external validation or accreditation. Please include qualifications of staff.  |
| Walton High School has specialist science status due to the high quality of teaching and learning throughout the department. There is access to a range of quality assured resources. This includes full access to the AQA and Edexcel secure areas.Some collaboration and sharing of resources with the OAKS (Ormiston and Keele SCITT), including close links with the OAKS Physics subject expert.The face-to-face sessions have been observed by the director of the OAKS – an Ofsted outstanding teacher training provider, based at Keele University and their Physics subject expert.The lead teacher who will be running all of the face-to-face days has a degree in Physics from the University of Nottingham and completed her PGCE and teacher training in Physics at the OAKS. She is currently teaching all of the year 10 and 11 triple Physics at Walton High School and has taught A level Physics and GCSE Astronomy for a number of years.The whole Physics department at Walton High School has received training in the new GCSE and the changes in the style of examination questions. This training was received from the Keele Science learning Centre and has ensured all members of the department have a solid understanding of the new required practicals. |
| **Individualisation for Participants** | Mention any separate routes possible, and how those routes are decided. |
| As mentioned, before each session, participants will have completed a diagnostic test. The results from these assignments will be used to inform planning of each session. There will be opportunity during the sessions for participants to do different level of activity depending on their ability and prior understanding of topics.Some participants will have never taught in a lab before. They will require a larger proportion of their time dedicated to basic lab work. Some participants will already be trained science teachers. This means that they will have a sound knowledge of lab safety already. Therefore, during practical time, they will be able to move on more quickly and can attempt A Level practical work. Those who already have strong mathematical skills will also be able to move on to A Level style exam questions. This will be decided individually for each topic and will depend on a number of factors, including the diagnostic tests. At the end of the course, each participant will be awarded a certificate which will outline the level of work completed during the course. Therefore if a particular participant has completed a significant amount of A level work, this will be outlined. |
| **Course Evaluation Mechanism** | Mention evaluation by participants, or external body, if you intend to publish survey results etc.  |
| At the end of the course, participants will have the opportunity to complete an evaluation form where they can include any room for improvement. This feedback will be taken into account if the course runs again next year.Feedback has been taken on board from the evaluation of both participants and the OAKS observers.Participants were very pleased with the structure of the course especially the training being during the day. It was planned so that each session was on a different day of the week meaning as little impact as possible to teaching. |
| **Lifelong Learning of Participants** | The TSST courses are inevitably of limited duration. Explain how participants are enabled to acquire the skills for autonomous learning beyond the course itself.  |
| As a Specialist Science School, we are committed to promoting excellence in Science and Mathematics. We are keen to ensure that we keep links with our participants to ensure they have continued support throughout their career. The participants will be provided with a solid understanding of not only the current GCSE Physics course, but also the practical skills required to teach in a lab. These skills are transferable to different experimental situations.The mathematical skills taught throughout this course will also be transferable. For example, while we may practice rearranging certain equations, the participants will be gaining the skills to rearrange any equation throughout the GCSE and A Level Physics courses.Participants will have ongoing access to all of the resources used in the face-to-face sessions through ‘Canvas’. There will also be an area available on ‘OneDrive’ where mentors and participants can share resources. This will remain available after the course has finished.There is additional ongoing support offered to candidates in the form of their mentor. They will have continued access to them after course completion. The mentor will also continue to send articles of interest to the participants after course completion. This will include articles from Physics Education, useful resources and ideas. The participants will already be members of Talk Physics which can also provide ongoing support. |

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