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| **PROGRAMME** |
| BA (Hons) Primary Education with QTS |

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| LEVEL | MODULE CODE | MODULE TITLE |
| 3 | PE306 | Mathematics in Education |

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| TITLE OF ASSIGNMENT | WEIGHTING |
| Own Mathematical Investigations | 50% |

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| DESCRIPTION OF TASK  Purpose:  This purpose of this assignment is to enable you to:   * develop your confidence as a mathematician and flexibility as a problem solver * recognise the application of mathematics in complex and novel situations * improve your ability to recognise patterns and make generalisations * reflect on your own learning and apply this to your pedagogy * manage your own learning   Guidance Notes:  It is expected that the investigations included in this file will reflect and make explicit how your own level of mathematical understanding has been extended during the course; this will be demonstrated through the learning journal. The learning journal can take the form of a running commentary (margin notes, speech bubbles, footnotes, etc.) that clearly shows your thinking processes and an analysis of your attitudes throughout the investigation. This should include references to published theory.  Two different areas of mathematics must be covered. The mathematical areas include:   * number, * algebra, * geometry, * data handling.   Some suggested investigations will be provided during taught sessions but you may also find your own. The source of the investigation should be clearly acknowledged and referenced.  One of the investigations must be completed independently but the other may be completed with a partner or group. If you do work with other people it is important that this is clearly acknowledged. The learning journal accompanying the investigation must be your own, although it will probably contain references to your colleagues. You will also need to include the contributions of your colleagues and a discussion of the issues raised by working with others in your evaluation.  It is impossible to describe the length of an investigation but there should be sustained development and each investigation should be brought to a conclusion or form of proof. Many people encounter stumbling blocks when undertaking investigations and it may be necessary to leave an investigation for some time and then return to it later. You will be shown examples of past assignments in a session and some are available in the library.  It is important to recognise that longer is not necessarily better. Avoid repetition, whether that is repeated diagrams or repeated calculations. If you feel it is important to include the full set of repetitious work then you should use appendices. You do NOT need to write out calculations where you have used a calculator or spreadsheet.  Once the two investigations have been completed there should be an overall evaluation which analyses what you have learned about mathematical investigations and learning. This should include references to published theory.  Contents:   * two investigations covering different areas of mathematics * learning journal accompanying the investigations * an overall analysis of the mathematics used and the learning processes for both investigations (1000 words) |

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| MODULE OUTCOMES TO BE TESTED  By the end of the module, students will be able to:   * recognise patterns and make generalisations * reflect on their learning and apply this to their pedagogy * manage own learning, with minimum guidance, through investigations   QTS Standards **Q2, Q7, Q14** (mathematics) |

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| ASSESSMENT CRITERIA  **Recognise patterns and make generalisations**   * ability to recognise and explain patterns * ability to make generalisations based on the patterns * ability to articulate clear explanations leading to a level of proof * clarity of communication through appropriate use of words, diagrams and symbols   **Reflect on their learning and apply this to their pedagogy**   * initial levels of mathematical understanding and confidence discussed * preconceptions identified * ability to reflect on and to evaluate personal learning and problem solving processes   **Manage own learning, with minimum guidance, through investigations**   * choice of original question * perseverance * imagination and sustained development of the investigations * range and scope of mathematics covered * progress made in mathematical understanding   **Selection and Analysis of Sources**   * acknowledgment of starting points and support for the mathematics * ability to select and discuss theories relating to the evaluation of own learning |

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| DATE AND TIME OF SUBMISSION  Monday 8th December 2008 BEFORE 4:00pm  This assignment will be marked anonymously so you must use your student number rather than name.  *Note to students: Any work submitted after this date will receive a mark of zero. All requests for extensions must be submitted to the Programme Leader for approval before the date stated. Such claims must be on the standard pro forma and must be accompanied by corroborating evidence. Following the date of submission requests may be made for the Board of Examiners to take extenuating circumstances for non-submission into account. All such requests must be made on the standard pro forma and must be accompanied by corroborating evidence*. |

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| DATE ON WHICH MARKED WORK WILL BE AVAILABLE FOR COLLECTION  Tuesday 20th January 2008 |

PLAGIARISM

Note to students: Your attention is drawn to the College’s Code of Practice covering plagiarism. Penalties for work found to be plagiarised are severe and can include the withdrawal of the right to resubmit work and termination of studies. On the submission of the assignment you will be required to sign a declaration that the work is your own and that all sources have been properly acknowledged

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|  | Recognise Patterns and Make Generalisations | Reflect on Own Learning | Manage Own Learning | Use of Sources |
| A\*  80+% | Patterns explored and explained fully; connections made within mathematics & to other contexts. Context considered when making and testing generalisations. An appropriate level of proof was presented. Mathematics communicated elegantly with the appropriate use of vocabulary and symbols. | Initial levels of mathematical understanding and confidence examined. Perceptive and analytical commentary on the learning, its aids and barriers. Preconceptions challenged and discussed. | Clear evidence of perseverance; thorough explanation of the overcoming of difficulties with detailed annotations showing how this was achieved. Original questions formulated to extend the investigation, showing an ability to work independently whilst pursuing lines of enquiry. Substantial progress in mathematical understanding | Scholarly approach to the selection, analysis and evaluation of sources |
| A  70-79% | Patterns explored in depth, possibly revealing layers. Many aspects considered when making and testing generalisations based on the patterns. Some attempt to prove statements. Mathematics communicated effectively with the appropriate use of vocabulary & symbols. | Initial levels of mathematical understanding and confidence considered. Thoughtful, analytical commentary on the learning which took place. Preconceptions considered and discussed. | Clear evidence of perseverance; thoughtful explanation of the overcoming of difficulties with annotations to show how this was achieved. Choice of investigations shows an inventive approach and lines of enquiry pursued thoroughly. Considerable progress in mathematical understanding | Critical approach to the selection, analysis and evaluation of sources |
| B  60-69% | Patterns within the investigations explored and explained. Generalisations based on the patterns and tested for different variables / contexts. Mathematics communicated clearly with appropriate use of vocabulary and symbols. | Initial levels of mathematical understanding and/or confidence considered. Thoughtful and generally analytical commentary on the learning which took place. Preconceptions considered | Evidence of perseverance and a clear explanation of the overcoming of difficulties. The choice of investigations shows an inventive approach and lines of enquiry pursued diligently. Clear progress in mathematical understanding | Good judgement in the selection, analysis and evaluation of sources |
| C  50-59% | Patterns within the investigations recognised; generalisations based on them with some explanation. Mathematics generally communicated clearly with appropriate use of vocabulary and symbols. | Some consideration of initial levels of mathematical understanding or confidence. Thoughtful and clear commentary on the learning which took place. Preconceptions referred to | Some evidence of perseverance and an explanation of how of difficulties were overcome was included. The choice of investigations shows differing areas and contexts selected and lines of enquiry have been developed. Some progress in mathematical understanding | Sound judgement in the selection, analysis and evaluation of sources |
| D  40-49% | Obvious patterns within the investigations were recognised; generalisations based on them, with attempts to explain them. Mathematics generally communicated clearly with occasional errors in the use of vocabulary and symbols. | Initial levels of mathematical understanding and/or confidence briefly considered. Some commentary on the learning which took place, with some acknowledgement of preconceptions. | Some evidence of persistence and explanation of how difficulties were overcome in at least one of the investigations. The choice of investigations shows differing areas selected. Lines of enquiry have been partially developed in both tasks. Some progress in mathematical understanding in at least one investigation | Some judgement in the selection, analysis and evaluation of sources |
| E  35-39% | Some patterns note; some generalisations made; some attempts to explain them. Mathematical communication impaired by some errors in the use of vocabulary and symbols. | Little consideration of initial levels of mathematical understanding or confidence and preconceptions. Limited commentary on the learning which took place. | Limited evidence of persistence and difficulties encountered were identified but not addressed. The choice of investigations shows limited judgement. Lines of enquiry have been partially developed. Limited progress in mathematical understanding demonstrated. | Limited use of sources / little analysis to link to the learning |
| F  Below  35% | Comments were made about patterns but generalisations and explanations limited. Mathematical communication impaired by frequent errors in the use of vocabulary and symbols. | Initial levels of mathematical understanding or confidence and preconceptions not considered. There was some description of the learning which took place. | Little evidence of persistence and difficulties encountered were neither identified nor addressed. The choice of investigations shows a very limited judgement in the selection of areas and contexts. Both tasks were partly developed with further lines of enquiry not considered. Little or no progress in mathematical understanding evident. | Very few sources used / sources do not link to the learning |