



Project Information			
Project Acronym			
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Project Director	Professor Robert Iliffe		
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Partner Institutions			
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Programme Manager	Alastair Dunning / Paola Marchionni		

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Overview of Project

1. Background

The foundations for the classical physics developed in the eighteenth and nineteenth centuries were laid by the mathematical and scientific achievements of Isaac Newton. To this day, Newton's work forms the core of the science taught in schools and universities across the globe.

The Newton Project (www.newtonproject.sussex.ac.uk), which has been funded since 1999 by the AHRB and the AHRC to make freely available high quality transcriptions of Newton's personal and theological manuscripts, was created with the express goal of 'bringing Newton's works to life.' The project seeks to make all of Newton's writings available to general, student, and scholarly audiences.

The Enlightening Science Project aims to build on the unique experience of the Newton Project, and to promote it to even larger audiences than it currently enjoys, informing these audiences of both the historical contexts and the core doctrines of his scientific works.

Using eighteenth century lectures on Newtonian concepts as a key resource, the Enlightening Science Project aims to engage audiences further and to promote a deeper understanding of Newton's works and their legacy. It will also demonstrate that it is possible to create materials which are both scholarly resources for professionals and sources of information and entertainment for a broader, non-specialist audience.

At the core of the Enlightening Science Project will be a series of tools and functionalities that will allow both expert and general users to understand more clearly the central concepts behind Newton's scientific achievements. It will do this by producing both textual and podcasted introductions to freely available transcriptions of Newton's texts, and by creating vodcasted recreations of the eighteenth century lecture courses in which Newton's doctrines were explained to both genteel and academic audiences – including re-creations of the spectacular experiments these lectures often included. In support of these fundamental resources, we will offer the consumer vodcast interviews with eminent scientists and historians.

2. Aims and Objectives

Our immediate goal is to make freely available online all versions of the most important scientific texts composed by Isaac Newton that were published in his lifetime. These writings, which revolutionised the fields of optics, physics, and theoretical astronomy, were *Opticks* (1704, 1706, 1717), and *Principia mathematica* (1687, 1713, 1726). In addition, we will add the drafts of *De motu corporum* which were composed in the three years prior to the first edition of *Principia* of 1687, alongside Newton's early research on optics, his optical lectures, relevant optical correspondence, and the manuscript drafts of the 'Queries' which were appended to the three editions of *Opticks*. Each of these texts will be accompanied by a written introduction as well as podcasts and vodcasts introducing students and the general public to their historical and intellectual contexts as well as to the core scientific doctrines contained within them.

The eighteenth century saw a proliferation of lecture courses which used both experiments and instruments to inform their audiences about Newton's most significant ideas. We will take a selection of these courses, both published and manuscript, and re-create them, making the re-creations freely available as vodcasts accessible through the UoS VLE, and as downloadable Learning Objects. Historians recognise the key role played in both academic and general Enlightenment cultures by the presentation of spectacular demonstrations of experiments. Indeed, Newtonian natural philosophy could not have been as successful as it was without the ability to portray the central tenets of his scientific discoveries through exciting displays of prismatic lights, electric shocks, and representations of the solar system in planetaria.

This innovative method of making Newton's physical theories comprehensible reflects the lectures of the eighteenth century inasmuch as it seeks to inform both scholars *and* the general public, and is

intended to be both informative and entertaining. Each vodcast will be presented as part of a coherent, mutually supportive collection of resources – the Learning Objects which will include texts, interviews with scientists and historians, podcast introductions, and so forth, which educators will be able to edit in order to integrate them into their own digital learning environments. It is this flexibility, alongside the vodcast reconstructions themselves, which makes Enlightening Science such an exciting and forward-looking project.

Just as Enlightening Science is a project which does not seek to provide static Learning Objects, it will help train a new generation of transcribers, coders and interviewers at the cutting edge of e-learning. The Newton Project has for a decade been committed to hiring individuals who combine a number of skills and talents, individuals able to work not only on the technical difficulties inherent within Newton's work, nor simply on the TEI encoding that is the basis of our approach, but who are capable of realising the potential of the project to reach many more users than is possible with printed works. Project members will both learn from the existing Newton Project team and forge new paths in e-learning.

At its heart, the Enlightening Science Project seeks to promote awareness of the extraordinary textual and conceptual riches which exist on the Newton project site, resources covering the fields of theology, physics, and optics. While we are, naturally, hopeful of attracting as large an audience as possible to the Newton Project website, our primary aim is to educate and engage individuals interested in Newton and his doctrines. We wish both to raise awareness amongst the general public regarding his works and the legacy they have passed down to the modern world as well as promote greater discussion of their significance. This will be accomplished through the creation of our Reusable Learning Objects, which will be supported by online forums which will enable the wider public to interact with leading scholars in the field.

In the next phase of the project we will be seeking to engage with both school and university teaching and learning communities and we will be trialling the use of podcasts both within Sussex and at selected secondary schools. To this end, we wish to draw on the experience of JISC in engaging and working with these communities – there are a number of studies, some by Prof. Ben du Boulay at Sussex, which have investigated the best way of maximising the effectiveness of the online teaching of science and mathematics. The Royal Society recognises the immense value that Newton, their president from 1703-27, has as an icon, and we are not only liaising with their educational outreach department, but also aiming to make our materials available to the Society as part of their 2010 celebrations.

3. Overall Approach

The project is concerned with the creation of six educational packages or Learning Objects, The project workflow will follow an Agile methodology combining multiple life cycles:

- Learning Objects (the main deliverables) will follow an incremental life cycle
- Podcasts, vodcasts and XML encoded texts (each of which is a resource within an individual LO) and project documentation will follow an iterative life cycle.

BaseCamp will be the project management system. This system places value on team communication and collaboration while keeping track of tasks and milestones.

Two main teams have been created to produce the resources within the main deliverables:

- Transcribers: comprises of two team members. Although each person will work independently transcribing and encoding historical texts, they will collaborate to integrate their work for publication on the website. The transcribers will work closely with the technical manager to ensure they follow the editorial and encoding guidelines adopted for this project.
- Performance Coordinator: comprises of one team member dedicated to interviewing and producing the recreation of famous experiments and eighteenth-century lectures. The performance coordinator will work closely with the project director and project manager to ensure quality in the final product and on-time delivery.

Although both teams will follow a resource-based approach, each team will have a different life cycle duration given that the scope and nature of their tasks is vastly different. In addition, each team member has ownership of their own tasks once the main planning and scheduling has been agreed in the team meetings.

A. Methodology:

Learning Objects

Project staff will liaise with the Project Advisory Board to prepare a provisional list of suitable educational themes. The team then will search what resources are already available for use and that are appropriate for the selected themes. The development of the resources will be part of the iterative cycle which will be described in the next section.

Once the project web site is under development, the Learning Objects will be created as repositories of the resources. The creation of the Learning Objects will take place between beginning of December and the end of January. As the resources are completed and signed off they will be published under the appropriate Learning Object.

We have selected one of the Learning Objects as our testing ground. For the selected LO we already have transcribed and encoded texts but vodcasts and podcasts will have to be created and tested.

Transparency is one of our main criteria therefore end users will have complete visibility of the developmental process of the Learning Objects (i.e. they will see them grow as we publish resources within each one).

XML encoded texts

The key manuscripts and printed works to be transcribed and encoded have already been identified. The need to transcribe and encode additional written works will be ascertained as the project progresses. The production of encoded texts will follow the already tested methodology developed in the Newton Project. [<http://www.newtonproject.sussex.ac.uk/prism.php?id=51>]

- Primary Research and Administration
- Transcription and Encoding of Source Texts
- Development of Technical Means of Outputting Encoded Material
- Image Capture and Output
- Synchronisation of Text and Image
- Enhancement of Previously Released Material

Podcasts/ Vodcasts – General Set up

The performance coordinator will start liaising with schools, societies and other organisations to access resources and secure cross-institutional cooperation. Key liaisons will be established by December 1. These include:

- Central School of Speech and Drama for access to student body
- University of Sussex Media School to access to access student body to manage filming, lighting etc.
- Royal Society, BBC etc. to maximise availability of expertise and cross-institutional co-operation
- Press to ensure suitable coverage when the project goes online

In addition to liaising tasks, the performance coordinator will ensure the smooth running of equipment and interviewing techniques. A number of tests will be conducted to this end before December 15. At least one focus group will be carried out to acquire feedback early on in the project.

Both the project director and the performance coordinator will identify the lectures to be podcasted before December 1 and ascertain the order for filming by January 1.

As an educational outreach project, we are committed to including high-level student participation wherever possible, whether this is in acting, costumes, film, lighting, or simply feedback on the learning objects and their usefulness to the student body.

Reconstructions of famous experiments

The specific experiments to be reproduced will be ascertained by mid November during the team meeting. We already have a list of possible experiments and the selection will be based on suitability in accordance to overall project goals and analysis of risks (i.e. access to instruments, collaboration problems, etc.).

The work on the reconstruction of famous experiments will strongly rely on the liaising strategies devised in the previous months. They will be instrumental in gaining access to appropriate

resources. In order to minimise the potential risks of being denied access to the first choice venue, a range of alternative venues will be selected. Once the experiments have been identified work will commence on:

- Producing the script and storyboard for each reconstruction
- Working with the theatre team (i.e. arrange rehearsals, costumes, etc.)
- Coordinate film and lights
- Arranging date of filming

The actual performance will take place once access to the appropriate venue has been cleared. As soon as a performance has finished the performance coordinator will start editing the rushes and producing the initial video. Editing will commence the day after each performance and we envisage that a review copy of the vodcast will be ready for viewing, notes and re-editing within the week.

The initial print will undergo an analysis of compliant with the technical specifications set for this project. Once a final edit has been approved, the vodcast will be prepared to the appropriate specifications within three days.

After the sign-off they will be published online within the appropriate Learning Object.

Interviews

The team will create an initial list of possible interviewees by mid November. Interviewees will be identified from the scientific and history of science communities. Initial criteria for selection will be based on interviewee's expertise and availability. The profile of the interviewer will also be a desirable criteria in order to maximise our dissemination strategy.

Based on the already identified main themes for the Learning Objects, the project director and the performance coordinator will produce an interview template and the necessary legal documentation.

The interview dates will depend exclusively on the interviewee availability. In order to be cost-effective we aim at grouping the interviews by location whenever possible.

Once the interview has been conducted, the editing process begins. This will be carried out by the performance coordinator. The editing process will also follow a set of criteria which at the moment is under discussion. The criteria will be finalised by mid-November.

The initial print of the interview will undergo the technical analysis to ensure compliance with the standards required by the project. After the sign-off they will be published online within the relevant Learning Object(s).

Documentation

During the first three months of the project the team will create the necessary documentation to kick-start the project. Afterwards, the documentation will undergo revisions and changes regularly based on lessons learnt, user feedback and the needs of the project and the team.

B. Important Issues to be Addressed

Interoperability. The very basis of our work is predicated on a considerable degree of interoperability between the Enlightening Science and Newton Projects. However, we are endeavouring to encourage as much collaboration and data sharing between parties as possible. Consequently, all our materials will be created in the formats that reflect either best practices or the most widely accepted standards in their respective domains. This alone should allow for the possibility of a considerable degree of interoperability between ourselves and other projects. However, in order to further encourage this we will aim to provide both the polished versions (i.e. edited interviews; transformed XML) and the raw source data for all of our materials as web services (wherever legally possible). Although the exact details of this service are expected to be rather minimalist in their complexity, advice will be sought from JISC. By providing our materials as a web service, we aim to allow other parties to repurpose our materials to suit their own needs and purposes. It is our aim that this will provide a transparency to our work by subjecting the quality of our raw materials and our editorial and coding policies to public scrutiny. It is also our hope that this web services approach will help minimizing the problems associated with the 'forking' of our data (namely, the creation and distribution of alternative and compromised files that do not reflect the latest editorial versions) – although one can never entirely prevent this when producing open access resources.

Evaluation. The main focal point will be quality, functionality, accessibility and achievement of the goals set for this project. Feedback via focus groups, online forums, and other means of

evaluation (to be determined) will be instrumental in keeping the project synchronised with the overall vision.

Accessibility. The same principles that have guided the Newton Project will be transferred to the Enlightening Project in terms of compliance with open standards.

Collaboration/Communications. Due to the incremental and iterative nature of the project, team collaboration and communication are essential and the cornerstone of our management principles. In the sections dealing with Methodology, there is a more detailed description of the methods to promote collaboration and team work.

In addition, user needs are at the core of the project's success. Therefore, collaboration and communication with our audience is crucial. To this end, a range of methods have been devised to facilitate community engagement and feedback which can help us direct the project to its envisioned goals.

Transparency. We aim at building a project that not only informs audiences about the content itself but that equally offers a window to the process of creating and developing the project and to the practices and decisions adopted. We hope this will activate full engagement by end users, who are the main beneficiaries of the project and whose needs will direct the project development.

C. Scope and Boundaries

Texts: Our core textual materials will be all the published variants of the three editions of *Principia* and *Opticks* that appeared in Newton's lifetime, as well as the texts of a number of lecture courses that appeared in the eighteenth century. The main documents constituting the text-encoding aspect of the project are as follows:

A. Optics

(i) [Pierpont Morgan Notebook](#); (ii) [Trinity Notebook](#) (CUL Add. Ms. 3996)
(iii) [Chemistry Notebook](#) (CUL Add. Ms. 3975); (iv) Optical lectures; (v) [Optical Correspondence](#);
(vi) *Opticks* (1704; [Book Three and Queries](#)); (vii) *Optice* (1706); (viii) *Opticks* (1717/18; [Book Three and Queries](#)).

B. Physics/ Rational mechanics

(i) 'De Motu Corporum' (c. Nov. 1684); (ii) 'augmented' 'De Motu corporum' (c. Dec. 1684); (iii) 'revised' 'De Motu Corporum' (early 1685); (iv) 'De Motu Corporum Liber Primus' (late 1685) and 'De Motu Corporum Liber Secundus' (c. autumn 1685; published in 1728; translated in Motte 1729). The 'liber primus' was expanded to form Books One and Two of the *Principia*, while the 'Liber secundus' (now CUL Ad. Ms. 3990) is a much earlier version of what became Book Three; (vi) Transcriptions of, and variants between, Books Two and Three in all editions of Newton's *Principia*, along with comments from Newton's interleaved copies.

C. Eighteenth Century Lecture Courses in Experimental Philosophy

These include books detailing lecture courses on the Newtonian philosophy by William Whiston (1716); John-Theophilus Desaguliers (1717, 1719 and 1745); Willem 's Gravesande, (1720); Francis Hauksbee (1730); James Bradley (lecture lists and notes as Reader of Experimental Philosophy at Oxford, 1732-61); Roger Cotes (1738); Benjamin Martin (1743 and 1771); Jean Antoine Nollet (1752); Tom Telescope (1761 and 1798); John Waltire (1767) and George Adams (1794). Where possible, we will acquire these texts from Google Books, Gutenberg, the Internet Archive, or some other Public Domain repository.

Podcasts: Our textual materials will be supplemented by the provision of podcasts and vodcasts. These resources will include explanatory introductions to key themes and works; spoken-word versions of the original key texts; interviews about the significance of Newton and his works with eminent historians and scientists; and demonstrations and commentaries of key Newtonian experiments.

Learning Objects: The most important product that we are creating are the six Educational Packages that create clusters of texts, podcasts, explanatory materials and links that will be available in the UoS Virtual Learning Environment as well as downloadable as learning objects for educators to edit and incorporate into their own Virtual Learning Environments.

D. Critical success factors:

- Focus on the user needs
- Quality
- Constant communications
- Collaboration
- Lay a strong groundwork on which to build continuously

4. Project Outputs

Project Main Deliverables:

- Six Educational Packages comprising of the following resources:
 - XML encoded texts
 - podcasts and vodcasts
 - introductory and explanatory texts and podcasts
 - supporting documentation (transcription guidelines, legal documentation, etc.)
 - project website that will provide users with access to the digital resources (texts, podcasts, documentation), the ability to download these resources and facilitate discussion.
 - Analysis reports

Knowledge outputs

- Publications in specialised journals
- Presentations in conferences, seminars and other fora
- RSS feed updating regular users of our latest releases and progress.
- Guidelines that can help build expertise within the team and outside.
- Online forum that can promote the work of the project, channel user's expectations and needs as well as serve as indicator of user engagement.

5. Project Outcomes

- Adds to the existing knowledge and experience of online teaching and learning both in terms of technical development and content delivery
- Provides wider access to scholarly materials traditionally restricted to expert users.
- Promotes the understanding of the central tenets of Newtonian physics
- Helps bridge the gap between humanities and sciences by demonstrating the importance of historical context for understanding contemporary issues in science
- Development of technical expertise within the team that can contribute to the overall work of the Newton Project.

6. Stakeholder Analysis

Stakeholder	Interest / stake	Importance
Scholarly Community	Access to high quality materials, fully searchable, with drafts and variants (and translations of all of these)	High
Teachers	How they can bridge the divide between humanities and science by introducing humanities students to the basic laws and concepts of physics.	High
Students in natural sciences	How they can engage with the historical contexts and the basic features of Newtonian physics.	High
Wider public	They can not only access but	

	also engage with Newton's heritage documents freely.	High
JISC	An example of good practice for accessible e-learning	High
University of Sussex	To work towards the strategic commitment of becoming a leading ICT institution by 2011. To promote its reputation for interdisciplinary research and digital humanities.	High
Liaison with Technology Enhanced Learning, tasked with the use of podcasting and other strategies for VLE.	Bill Ashraf, Director of Technology Enhanced Learning, will have an interest in the outcomes of this project.	High

7. Risk Analysis

Risk	Probability (1-5)	Severity (1-5)	Score (P x S)	Action to Prevent/Manage Risk
Uncooperative academics (re: interview and forums)	2	4	8	Interviews already lined up with several figures interested in participating.
Slow/Delayed production rate	2	3	6	Educational package development will be incremental starting with features already in production or readily available. Goodwill within the UoS to the Newton Project could result in the acquisition of funds to hire trained casual employees of the NP to speed up production.
Software development delayed	1	5	5	Technical requirements have already been established. We have already adopted an Agile development strategy to release and improve core technologies.
Lack of engagement with and of user community	2	4	8	UoS is already committed to the creation and promotion of innovative online learning environments so the project will benefit from using their advertising channels. Submit materials to iTunes University (and advertise their presence there). Team members capitalising on existing professional relationships (peers, professional associations, schools) to expand awareness and encourage participation. Focus groups involving students and other end users as part of analysis of project features and general usage.

Delayed recruitment/ Staff resignation	1	2	2	Transcription and interviewing skills already exist in half-time/contract Newton Project team members enabling us to alleviate immediate pressures of any short-term labour shortages that may occur throughout the project life. Promote position on appropriate mailing lists (JISC, TEI). Contact other TEI-based text encoding projects and colleagues in the Department specializing in oral history based work to enquire if they know of any skilled individuals seeking employment.
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8. Standards

Name of standard or specification	Version	Notes
XML	1.1	Texts encoded according to custom schema combining TEI P5 & MathML
MP3		64 kbps mono; 128 kbps stereo
MPEG-4		Bit-rate and dimensions of web deliverable product still to be decided, but two different versions will be offered (one – 320x240 – suitable for iPods and other portable devices; and another larger version for viewing on larger monitors)
METS	1.7	For organizing the resources within the digital library
MODS	3.3	For bibliographic metadata
XLST	1.0	Currently, there is no anticipated need to adopt XSLT 2.0 on the project but this decision will be revisited should circumstances warrant
ADL SCORM	1.2	
RSS	2.0	Syndication of podcasts will be done both through our own web presence and iTunesU (for increased public profile and impact)

9. Technical Development

The Enlightening Science web site will be hosted on the main Newton Project server, which already has the required software (i.e. Apache server, eXist and Apache Cocoon). The site will contain a large collection of textual, audiovisual materials available as both individual resources and e-learning educational packages (SCORM 1.2) [the details on the specific formats of each file type can be found above]. The metadata for the individual resources will be encoded according to the Metadata Object Description Language (MODS 3.3) schema while the collection itself will be described using the Metadata Encoding and Transfer Schema (METS 1.7) schema. The combination of these two layers of metadata – stored in an eXist database and dynamically transformed by cocoon – should allow for the creation of effective finding and organizational aids.

The xml texts will be transformed from the server into html using the already existing core library of XSLT code employed on the Newton Project – although a new layout wrapper will need to be written in order to reflect the branding and organization of the Enlightening Science Project.

10. Intellectual Property Rights

All materials on our site will be published under the JISC's Open Educational Licence. The only IPR issues arising from this project come from the use of manuscript materials now in the possession of Cambridge University Library. We have budgeted for a small license fee to cover the use of these documents in our project; at the end the project they will remain freely accessible. We will also obtain releases from all interviewees for the podcasted elements of the project.

Project Resources

11. Project Partners

The Royal Society has agreed to work with us in making major scientists available for interview. Although the interviews will take place during the spring, over the next three months we are setting up specific topics and times for these meetings. Also, we are having meetings in mid-December with representatives from the SSHRC History of Science Network in Canada, who are also going to make pedagogical materials from C18 and C19 science freely available online over the next year.

12. Project Management

Name / Position	Role
Professor Robert Iliffe Project Director r.iliffe@sussex.ac.uk	Directs the project.
Ms Yvonne Martín-Portugués Santacreu Project Manager (0.5 FTE) y.santacreu@sussex.ac.uk	Manages the project, ensuring the on-time delivery of all the project outputs. Coordinates the personnel and tasks involved and implements the digital infrastructure along with the technical director. Budget holder.
Dr Michael Hawkins Technical Director (consultant) m.hawkins@sussex.ac.uk	Directs the development of the underlying technological infrastructure of the project. Provides technical guidance to team members. Ensures compliance with current best practices/standards
Dr Pete Langman Performance Coordinator (full time) p.langman@sussex.ac.uk	Coordinates and films interviews with scientists and historians. Arranges for the recreation of both modern and eighteenth century demonstration experiments.
Dr Margarita Fernandez Chas Transcriber (0.5 FTE)	Transcribes and encodes historical texts. Proofreads texts created by other transcriber.
Dr Abdul Q Sami Transcriber (0.5 FTE)	Transcribes and encodes historical texts. Proofreads texts created by other transcribers

Advisory Board

The Enlightening Science will share the Advisory Board set up for the Newton Project. Additional members are currently under consideration for the particular objectives of this project.

Team Meetings

Regular team meetings are the cornerstone of the project planning and development. We will hold team meetings every month and one-to-one meetings (schedule to be determined in the next team meeting). The main objectives are:

- Keep the project plan synchronised with the project's vision
- Measure progress, review schedules and priorities and incorporate tasks based on:
 - the overall guiding vision of the project
 - the feedback received by end users

- Promote teamwork and collaboration via exchange of information

Project Reporting

Project reporting will include the following:

- Quarterly reports on progress to the Advisory Board.
- Monthly reports on progress to the team and the Project Director. These will coincide with the monthly team meetings and will include updates on scheduling.
- Reports to JISC – two progress reports and a final report.

Training

Transcribers will be trained in TEI P5 guidelines and MathML DTD. Training will take place in the next two weeks. Other training needs will be met if and when they arise.

13. Programme Support

- Dissemination strategies
- Web services
- Advise and recommend contact with potential collaborators

14. Budget

See Appendix A.

Detailed Project Planning

15. Workpackages

See Appendix B.

16. Evaluation Plan

The development of evaluation protocols is part of our workpackages.

Timing	Factor to Evaluate	Questions to Address	Method(s)	Measure of Success
ongoing	Quality of Learning Objects, our main deliverables.	Usability, coherence, engagement	User testing, peer review, focus groups	Positive test reports
ongoing	Effectiveness of Learning Objects	Are learning objects encouraging users to access resources more widely	User logs	High percentage of users view textual materials after viewing vodcasts
ongoing	Quality of digital deliverables	Are deliverables created to the correct specification	Visual, audio and software tools	Digital assets comply
ongoing	Quality of podcasts	Are podcasts fit for purpose	Review by project team	Podcasts are judged to be fit for purpose
ongoing	Quality of vodcasts	Are vodcasts fit for purpose	Review by project team	Podcasts are judged to be fit for purpose
ongoing	Quality of transcriptions	Are transcriptions accurate and appropriately tagged	Continual review by transcribers, random spot checking by performance co-ordinator	Transcriptions are judged to be sufficiently accurate
ongoing	Textual introductions	Validity, accuracy, readability	Review by project team	Introductions deemed to meet specifications
ongoing	Awareness of Newton and his mathematical and scientific achievements	Have we reached audiences other than scholars in the humanities?	Online forums, user feedback	Positive feedback by variety of end-users Interest shown by schools and other institutions to

				access the materials.
ongoing	Accessibility of the materials via UoS VLE	Are educators can integrate them into their own teaching environments?	VLE registrations	
ongoing	Educational value of the project/materials	Are users engaging meaningfully with the materials and content?	Forum discussions. Other methods to be determined as project matures.	Positive user feedback

The team is also considering a list of the micro-criteria for podcasts and vodcasts which makes them fit for purpose:

Podcasts: audio quality; relevance of material; accuracy of spoken word

Vodcasts: suitability for small and large screen projection

Lectures – contextual accuracy; adherence to script

Experiments – contextual accuracy; scientific relevance; adherence to script

Interviews – relevance to theme of learning object; engagement of user.

17. Quality Plan

Output	Learning Objects				
Timing	Quality criteria	QA method(s)	Evidence of compliance	Quality responsibilities	Quality tools (if applicable)
Ongoing	All components are fully integrated and consistent with main educational themes	Reading/listening for consistency	Learning Object signed off	Project Director	
	Accessibility of the materials	Provide SCORM files			
	All resources have detailed metadata	Formatting Creating metadata	MODS/METS validates Metadata signed off	Project Director/ Technical Manager/ Project Manager	

Output	XML encoded texts				
Timing	Quality criteria	QA method(s)	Evidence of compliance	Quality responsibilities	Quality tools (if applicable)
Ongoing	Comply with TEI P5 guidelines and MathML DTD	Code review by team members before online publication. Ongoing revision after publication based on feedback by team members or external users	Document validates against Enlightening Science RelaxNG schema (incorporating TEI P5 and MathML)	Transcriber	
	Searchability of materials	Metadata – MODS METS	Validation	Technical manager	
	Web accessibility	WAG			

Output	Interviews
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Timing	Quality criteria	QA method(s)	Evidence of compliance	Quality responsibilities	Quality tools (if applicable)
ongoing	Relevance to learning object	Interview template provided – interview observed.	Template approved – interview signed off.	Project director / performance co-ordinator	

Output	Podcasts of lectures				
Timing	Quality criteria	QA method(s)	Evidence of compliance	Quality responsibilities	Quality tools (if applicable)
ongoing	Fidelity to textual resource provided	Listening to podcast alongside text	Podcast passed for inclusion within LO	Performance co-ordinator	
ongoing	Sound quality of podcast	Audio check	Sound quality deemed acceptable	Performance co-ordinator	
ongoing	Podcast produced to agreed technical standards	Software check	Podcast found compliant	Performance co-ordinator	

Output	Podcasts of lectures				
Timing	Quality criteria	QA method(s)	Evidence of compliance	Quality responsibilities	Quality tools (if applicable)
ongoing	Historical and textual accuracy.	Storyboard and script provided	Storyboard and script approved	Project director / performance co-ordinator	
ongoing	Audio and video quality acceptable	Visual and audio check	AV quality deemed acceptable	Performance co-ordinator	
ongoing	Synchronisation of audio and video accurate	Visual and audio check	Synchronisation deemed acceptable	Performance co-ordinator	
ongoing	Quality of editing	Viewing of vodcast	Vodcast signed off	Project director	
ongoing	Vodcast produced to agreed technical standards	Software check	Vodcast deemed compliant	Performance co-ordinator	

Output	Vodcasts of Experiments				
Timing	Quality criteria	QA method(s)	Evidence of compliance	Quality responsibilities	Quality tools (if applicable)
ongoing	Scientific accuracy	Storyboard and script provided	Storyboard and script approved	Project director / performance co-ordinator	
ongoing	Quality film	Viewing entire vodcast	Vodcast approved	Project director	

18. Dissemination Plan

Timing	Dissemination Activity	Audience	Purpose	Key Message
Throughout the project	Visits Online activities	School students, university students, teachers,	Raise awareness about Newton and his scientific	Are we providing the tools/functionalities

Timing	Dissemination Activity	Audience	Purpose	Key Message
		academics Wider public (online activities)	achievements Bring about change in educational methodology by narrowing the gap between sciences and humanities. Engage the audience in a meaningful way Continue to build identity within the academic community.	to allow you to understand Newton's legacy? What do you want/need? How can we improve what we are doing? How can we help you incorporate the tools developed into your teaching/ learning?
Throughout the project	Conferences, seminars and other forums	Academics, students	Raise awareness about the project. Facilitate a deeper understanding of the objectives of the project. Encourage engagement	Information about the project and its objectives. Materials that are scholarly resources for professionals and effective educational tools Further research on e-learning
Throughout the project	Publications in academic journals	Academics, students	Raise awareness about the project. Facilitate a deeper understanding of the objectives of the project. Encourage engagement	Information about the project and its objectives. Materials that are scholarly resources for professionals and effective educational tools Further research on e-learning
	Marketing activities	Academics, students, teachers, wider public	Raise awareness about the project. Facilitate a deeper understanding of the objectives of the project. Encourage engagement	Information about the project and its objectives. How the resources can be used to facilitate understanding of complex scientific ideas Quality of the educational tools

The dissemination strategy will capitalise on existing knowledge and expertise by the Newton Project team members and Advisory Board as well as on existing links with other organisations able to offer advice and resources. The Performance Coordinator's outreach plans will be supported by a dynamic website offering regular updates on the progress of the project, particularly at key times during the project, and an online forum where members can discuss particular topics related to the project. The project will also provide RSS 2.0 feeds of updated material.

19. Exit and Sustainability Plans

Project Outputs	Action for Take-up & Embedding	Action for Exit
Enlightening Science Website	Easy to use. Information easily accessible. Good search capabilities.	Progressive enhancement. Website is well maintained to

	Functionality.	prevent the broken window effect.
Learning Objects	Analyse user engagement with content. Generate promotional actions and implement changes based on feedback	Ongoing promotional activities via RSS feeds, conferences, school visits, etc. Focus groups and other tools to identify user needs
Podcasted materials	High-profile interviewees to generate or increase interest. Early tests to identify problem areas that affect user engagement (content or technical). On-going feedback to implement change. Technical quality assurance. Promotional activities	Ongoing promotional activities aimed at media and educational organisations
XML encoded text	Analyse user engagement. Build on the lessons learnt through the Newton Project.	Ongoing promotional activities aimed at media and educational organisations
Project Documentation		Project documentation is updated regularly. Hand over latest versions at the end of the project.

Project outputs that may have potential to live on after the project ends, why, how they might be taken forward, and any issues involved in making them sustainable in the long term.

Project Outputs	Why Sustainable	Scenarios for Taking Forward	Issues to Address
Enlightening Science Website	Active project site has already been ensured by the UoS for three years Core functionality will be maintained by the university's sustainability plan for the Newton Project until 2014	Work with JISC to ensure long-term maintenance level survival	Updating server software, Project code and provision of new hardware. Arrange for collaboration to facilitate off-site storage of materials. Deposit materials in institutional repository, JISC Depot.
Podcasted materials	They are in the most widely used formats for audio and visual files at present and should this change new versions can be readily generated from the master files. No DRM.	Long term survival Evaluate the rise of new formats/codecs Periodically revisit the issue of whether to allow downloads of the uncompressed source files (legal/technical issues)	Arrange for collaboration to facilitate off-site storage and syndication of materials. Deposit materials in institutional repository, JISC Depot.
XML encoded texts	Text is UTF-8 and data is encoded using the most widely recommended schema for textual scholarship and the W3C recommendation for encoding	Embed transcription guidelines in schema using TEI's ODD syntax for Roma – thereby making the combination of the texts with the schema a self-describing data set.	Arrange for collaboration to facilitate off-site storage of materials. Deposit materials in institutional repository, JISC Depot.

	mathematical content.		
Project Documentation	Future analysis, component of learning objects. Provide basis for future projects	Periodically revisit transcription guidelines in light of user and transcriber feedback and general changes reflected in the TEI community.	Arrange for collaboration to facilitate off-site storage of materials. Deposit materials in institutional repository, JISC Depot.

Appendixes

Appendix A. Project Budget

Appendix B. Workpackages