Teacher Guide
Unit 3

Technology Impact on Society

For first teaching from September 2013
For first assessment from Summer 2014

For first award in Summer 2014

space science technology

Level 2 Certificate

UNIT 3: Technology Impact on Society

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Learning outcome 1: Understand the potential consequences of artificial lighting in society

1.1 Understand three negative consequences of artificial lighting

- Identify and give examples of different types of light pollution under the categories:
    - Sky glow
    - Glare
    - Light trespass
    - Light clutter

- Students should prepare a table of results highlighting three types of light pollution and provide examples of the implications of poor lighting under the criteria:
    - Environment
    - Society
    - Economy

Pupils should be able to identify and provide an example of each type of light pollution for urban and rural communities either from their respective locality or within the province. A useful resource for background reading is: http://star.arm.ac.uk/darksky/armagh.html

1.2 Suggest how the impact of artificial lighting can be reduced

- Using results from 1.1, the learner should be able to show understanding of what simple measures can be taken to reduce the impact of artificial lighting against each of the criteria chosen from above. This can be done by researching how other regions throughout UK, Europe or globally have introduced guidelines or policies to tackle the light pollution problem and producing a report or presentation highlighting the benefits of reduced artificial lighting in those regions. Care should be taken to identify the types of light pollution identified and seen as a priority for concern in those regions.

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1.3 Carry out an audit of artificial lighting used in their local area and find a suitable way to present findings and conclusions to a local government audience

- As an individual or acting as a member of a team, students should show evidence of carrying out an audit and own work into artificial lighting with relation to their respective community under the titles:
  - Home
  - School
  - Leisure
  - Retail

- The learner should be able to provide evidence as an oral presentation or slides and/or presentation notes of understanding on the:
  - -purpose of the artificial lighting in question
  - -any types of light pollution occurring as a result of this lighting
  - -suggestions and recommendations for reducing the impact to environment, society and economy

- [Suggestion] Centres could enhance the student experience by providing access to light meters or a light measuring technology to record and tabulate results

1.4 Research the aims and objectives of an organisation committed to dark skies

- Students should interrogate the websites of three organisations committed to dark skies and provide comment and feedback on one aspect of how each organisation is encouraging engagement with:
  - -General Public
  - -Local, regional or national government or authorities
  - -Education

- Students should acknowledge sources of information and highlight where engagement has had a significant impact.

A useful guide to these organisations and information for all of the research required is: http://star.arm.ac.uk/darksky/index.html

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2.2 Investigate the arguments for and against the use of cloud computing

- Candidates should research cloud computing, using a search engine and source some information which would help then to explain what cloud computing is, and how it works. They should then present this in their own words using a software package such as PowerPoint, Prezi or something similar to briefly explain the concept of cloud computing to an audience. Candidates should include some images in their presentation, and explain appropriately some technical terms such as thin client, front end, back end, applications, data storage, middleware and network.
- Candidates should research the advantages of cloud computing such as the removal of some software costs, the potential reduction in hardware costs and scalability. Candidates should add their views to their presentation.

2.4 Explore the advantages and disadvantages of future development in space exploration or human spaceflight.

 [Suggestion] Students may wish to do this exercise in tandem with the Human Spaceflight module

- 'Should we continue to go into space?' Students consider this statement and identify two future space projects, one manned spaceflight and one unmanned space exploration. Working as an individual or as part of a team, students discuss the pros and cons of future space based activities. Students should consider topics such as cost, benefit to society, knowledge development and environment and develop a presentation and presenter notes either for or against the development of future space mission.
- Working as an Individual, or as a team member, students provide their own conclusions on the above statement and highlight the reasoning behind their remarks. Evidence must be provided on own work if involved as part of a team

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Some useful web resources and articles:

- http://space.about.com/od/spacebasics/a/Future-of-Manned-Space-Flight.htm
- http://www.science20.com/brinstorming/near_future_manned_spaceflight-93648
- http://www.esa.int/esaHS/index.html
- http://www.esa.int/esaCP/Expanding.html