

SMSC in Science – Redborne

Upper School

Slides:

1~7: SMSC background information

8~9: Outreach Activities: Mr Ciampa

10~13: STEM/CREST/Environment
Clubs: Mr Dobson

11~19: Biology Club Activities: Dr Juty

20~21: Outreach Activity: Festival of
Chemistry: Dr Sutton

SMSC in Science

The Spiritual, Moral, Social and Cultural Development of students has long been recognised as a fundamental requirement of education.

Research into high quality education reveals that focussing on the technical aspects of pedagogy is “bound to fail unless the growth of the whole person – social, emotional, moral, spiritual and intellectual, is the pedagogical target“, and that these elements seem to be present where intellectual advancement and academic achievement are being maximized. (Source: Lovat, T., Toomey, R., Clement, N. (Eds.) 2010, The International Handbook on Values Education and Student Wellbeing).

The SMSC development of students is an integral part of their education at Redborne Upper School. This document provides details of some of the rich learning experiences that have allowed our students to gain a wider appreciation of issues faced in the world around them.

SMSC in Science

SMSC guidance has recently been updated to take account of recent changes in the law and in the Ofsted inspection framework introduced in 2003. As of September 2014, new guidance regarding the interpretation of ‘spiritual’, ‘moral’, ‘social’ and cultural’ development has been put forward, with the following ‘working definitions’ provided on an advisory basis:

Spiritual

- Pupils' spiritual development is shown by their:
- ability to be reflective about their own beliefs, religious or otherwise, that inform their perspective on life and their interest in and respect for different people's faiths, feelings and values
- sense of enjoyment and fascination in learning about themselves, others and the world around them
- use of imagination and creativity in their learning
- willingness to reflect on their experiences.

Moral

- Recognise right and wrong; respect the law; understand consequences; investigate moral and ethical issues; offer reasoned views.
- Pupils' moral development is shown by their:
- ability to recognise the difference between right and wrong, readily apply this understanding in their own lives and, in so doing, respect the civil and criminal law of England
- understanding of the consequences of their behaviour and actions
- interest in investigating and offering reasoned views about moral and ethical issues, and being able to understand and appreciate the viewpoints of others on these issues.

Social

- Pupils' social development is shown by their:
- use of a range of social skills in different contexts, including working and socialising with pupils from different religious, ethnic and socio-economic backgrounds
- willingness to participate in a variety of communities and social settings, including by volunteering, cooperating well with others and being able to resolve conflicts effectively
- acceptance and engagement with the fundamental British values of democracy, the rule of law, individual liberty and mutual respect and tolerance of those with different faiths and beliefs; the pupils develop and demonstrate skills and attitudes that will allow them to participate fully in and contribute positively to life in modern Britain.

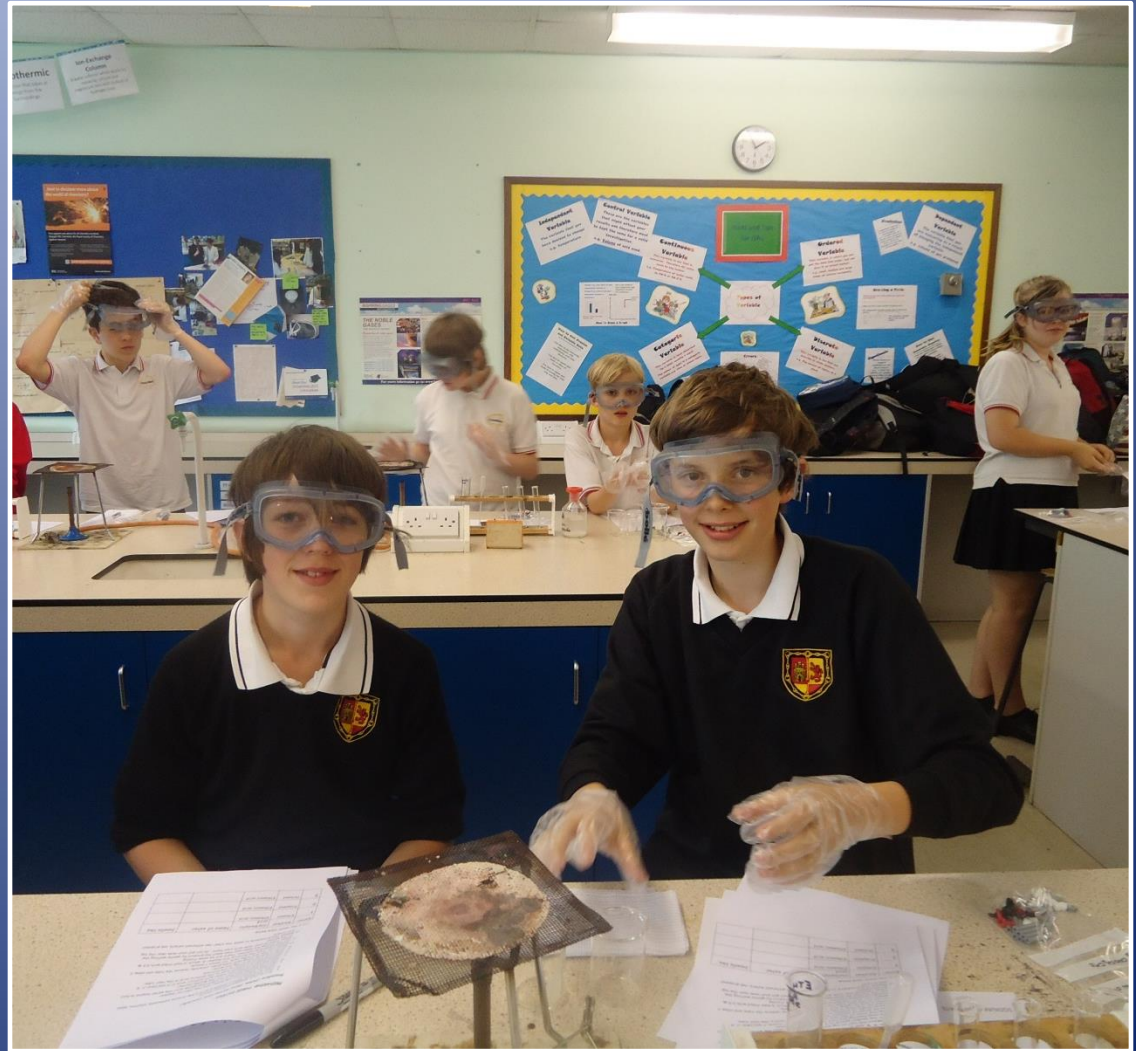
Cultural

- Pupils' cultural development is shown by their:
- understanding and appreciation of the wide range of cultural influences that have shaped their own heritage and that of others
- understanding and appreciation of the range of different cultures within school and further afield as an essential element of their preparation for life in modern Britain
- knowledge of Britain's democratic parliamentary system and its central role in shaping our history and values, and in continuing to develop Britain
- willingness to participate in and respond positively to artistic, sporting and cultural opportunities
- interest in exploring, improving understanding of and showing respect for different faiths and cultural diversity, and the extent to which they understand, accept, respect and celebrate diversity, as shown by their tolerance and attitudes towards different religious, ethnic and socio-economic groups in the local, national and global communities.
- [*Ofsted School Inspection Handbook \(September 2014\)*](#)

Outreach Activities – Mr Ciampa

A variety of science-based activities have been arranged for groups of students to experience during their visits to Redborne Upper School, developing both social skills and nurturing their fascination and enjoyment of science.

- Y8 students from direct feeder middle schools (Alameda and Woodlands) attend up to 3 G&T sessions in chemistry biology and physics. Feeder schools select the students.



Outreach Activities – Mr Ciampa

- Y8 students from a wider range of feeder schools attend a 'forensic science experience'
- Y4 students from local lower schools come for an afternoon to get their Bunsen burner licence (flame colours experiment)
- Y5 & 6 students have Farm visits during lambing.
- The science department contributes one lesson of science per Tutor Group for Y8 students during transfer days.



STEM, CREST and Environment Clubs: Mr Dobson

These clubs are run to promote further interest in science and the environment, and are particularly suited to Gifted and Talented students and those with an enthusiastic interest in the above. Examples of SMSC criteria fulfilled by the STEM and CREST award activities are provided below, as are details of a topical climate-related project undertaken by members of the Environment Club.

The spiritual development of pupils is shown by their:

- sense of enjoyment and fascination in learning about themselves, others and the world around them

STEM - Students are encouraged to gain a deeper understanding of some key issues in science, generally with a direct societal application (e.g. DNA testing - Can you trust food labelling?)

- use of imagination and creativity in their learning

CREST - this year's cohort are designing a payload for a weather balloon that will enable them to launch high enough to photograph the curvature of the Earth

- willingness to reflect on their experiences.

STEM & CREST - All activities are rounded off with students saying how they'd change their approach to be more successful if attempting it again

The moral development of pupils is shown by their:

- ability to recognise the difference between right and wrong, readily apply this understanding in their own lives and, in so doing, respect the civil and criminal law of England

CREST - the balloon launch will require legal permission from the CAA

STEM - DNA testing and its role in paternity cases and crime detection/deterrence

The social development of pupils is shown by their:

- use of a range of social skills in different contexts, including working and socialising with pupils from different religious, ethnic and socio-economic backgrounds

STEM & CREST - all students from Redborne are welcome to participate and those that do are from a range of R/E/S-E backgrounds

- acceptance and engagement with the fundamental British values of democracy, the rule of law, individual liberty and mutual respect and tolerance of those with different faiths and beliefs; the pupils develop and demonstrate skills and attitudes that will allow them to participate fully in and contribute positively to life in modern Britain.

STEM & CREST - all students from Redborne are welcome to participate and those that do are from a range of R/E/S-E backgrounds - as in all school activities, no intolerance is permitted

The cultural development of pupils is shown by their:

- willingness to participate in and respond positively to artistic, sporting and cultural opportunities

CREST - The artistic opportunities presented by the chance to acquire images of the Earth from 30,000 feet are an important driver in inspiring students to successfully complete their challenge.

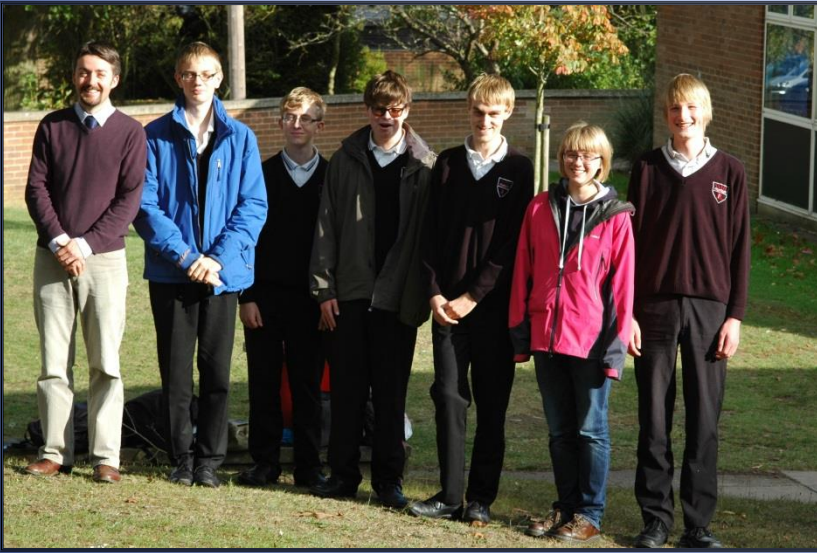
Bee~wolf Project

The Bee~wolf *Philanthus triangulum* is a species of wasp that was once regarded as one of the great British rarities, and was considered to be vulnerable to extinction in Britain. During the 1980's, in response to our warming climate, it underwent an impressive range expansion and can now be seen hunting the honeybees from the hives maintained by the Redborne Farm in Bedfordshire. This fascinating species paralyses the bee with its sting and carries the bee underneath its body as it flies back to provision its nest.



Environment Club

Several other scarce species were found in the school grounds during the study, including the spectacular Ruby-tailed Wasp *Hedychrum nobile*, which has yet to be added to the British List!





Biology Club

Dr Juty



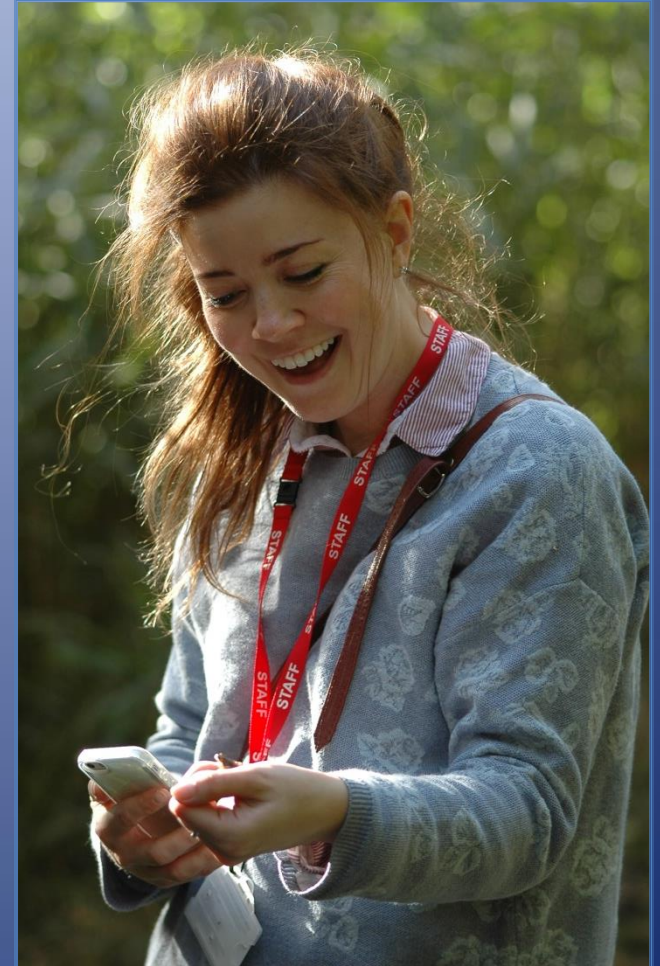
- The Biology Club has been a great success this year, well attended by regular group of students from year 10 and 11, and occasionally supplemented by sixth form students (e.g. when an external speaker came to talk about the role of animals in scientists' attempts to treat or cure human diseases)
- In addition to a rich curriculum of activities, the students embarked on a major project to study the life of the unique and regionally important Flitwick Moor nature reserve, making some significant discoveries, as the following slides reveal:

Flitwick Moor



The autumn weather was kind to us as we searched for lizards, grasshoppers and dragonflies

Flitwick Moor is regionally and nationally important for its fungi, mosses and lichens. This is the Fly Agaric toadstool



G&T Coordinator, Miss Hounam, falls in love with a frog

Flitwick Moor



Off to the pond to hunt for water bugs!



Team assembled



In search of hidden wonders....

Flitwick Moor



Clockwise from top left: Mariska finds a water boatman; Dr Judy's favourite, the noisy and startling Screech Beetle, once sold as a novelty by Victorian street vendors; a huge dragonfly larva; the girls after a shoe-counting exercise reveals none have been left in the mud; and the surprise of the day, the extraordinary Long Water Scorpion



Flitwick Moor – Special Great Diving Beetles that we found

‘The Wasp’ *Dytiscus circumflexus* – 3rd and 4th records for Bedfordshire



‘Black Belly’
Dytiscus semisulcatus –
first record for
Bedfordshire!



The activities of the Biology Club make a major contribution to the wider life of the students, allowing them to appreciate and evaluate **social, ethical and cultural** aspects of what they experience. In addition to the **spiritual** aspect of gaining a “sense of enjoyment and fascination in learning about themselves, others and the world around them”, they have considered the many **moral and ethical** issues which govern the delicate balance that sees the need to feed an increasing population, countered by the need to preserve our rich natural heritage for future generations.

CONTRIBUTION TO SCIENCE: SOME OF THE FINDS MADE BY THE BIOLOGY AND ENVIRONMENT CLUBS ARE SIGNIFICANT IN A LOCAL, REGIONAL AND NATIONAL CONTEXT, AND CAN BE LINKED TO THE MOVEMENT OF SPECIES IN RESPONSE TO OUR UNDENIABLY WARMING CLIMATE. THESE ARE BEING WRITTEN UP BY THE STUDENTS FOR PUBLICATION IN SUITABLE JOURNALS.

Salters' Festival of Chemistry

In May 2014, Dr Sutton was invited by the University of Bedfordshire to be the guest lecturer for the annual Festival of Chemistry. The talk, which has been shared with staff and students at Redborne, revealed the importance of insects as a future source of nutrition for a human population that is doubling every 50 years. The use of flour made from ground crickets, for example, is now expected to be routinely used as a high protein and mineral ingredient in many foods.



From left: Dr Sebastien Farnaud, Head of Science Faculty at University of Bedfordshire Professor Prasad S. Sreenivasaprasad, Dr Bushra Ahmed, Dr Peter Sutton, Fleur Layzell (Salters' representative) and Sue Thompson (Royal Society of Chemistry)

The students were introduced to their future food resource



Thanks

To all of the above-named staff who kindly provided details of their enrichment activities:

Mr Ciampa, Dr Juty, Mr Dobson