

# NINE CHALK RIVERS INTERPRETATION

## Geodiversity Information Outreach

Classroom Session Report  
Ashwicken Primary School, 17-3-2014

Tim Holt-Wilson  
Norfolk Geodiversity Partnership

---

### Background

I was asked to deliver a classroom session at Ashwicken C. of E. Primary School (East Winch Rd, King's Lynn, PE32 1LY) to support classwork in the KS2 Science curriculum by providing information about local geodiversity. This was arranged by contacts between the school and Gemma Clark, Community Involvement Officer at the Nine Chalk Rivers Project. The class was Year 3 (approx nine year-olds) consisting in 24 pupils, under the tuition of the class teacher Mrs Linda Preston supported by three teaching assistants.

### Session preparation

I established initial contact with Linda Preston by telephone. She explained that Earth-science related subject matter was currently being covered, including Mountains and Volcanoes; the distinction between Sedimentary, Igneous and Metamorphic rocks had been touched on; it would be desirable to weave these subjects somehow into the geodiversity session. There was a field trip to the Gaywood valley planned for the next week. We agreed that local stones and pebbles from the topsoil could provide a good immediate interpretive focus. The aim would be to inspire and inform the pupils about linkages between their local physical environment (the valley and its setting) and wider Earth science themes, set against the background of geological time. Pupils were to be asked in advance to collect three examples of locally-sourced stones to bring to the session.

I carried out background research into the variety of local stones by visiting public footpaths and collecting a variety of c.100 hand specimens at three locations:

- Well Hall Farm, Gayton; sited on Lower Chalk at the base of the West Norfolk chalk escarpment, at circa NGR TF724203.
- Near the church, Ashwicken; sited on farmland developed on clayey glacial till, at c. NGR TF698189.
- Brow of the Hill, Bawsey; sited on former heathland developed on sandy glacial till, at c. NGR TF682189.

These specimens were washed and classified as follows, and potential interpretive value noted:

Specimen	Date	Source	Potential stories / themes
Chalk	Late Cretaceous	Local	Soft and hard varieties & local building stone
Flint	“		Weathered varieties & local building stone
Red Chalk	Early Cretaceous	Local	Why is it pink?
Spilsby Sandstone	“	Erratic, Lincolnshire	Sedimentary rock & glacial ice transport
Carstone	“	Local	Sedimentary rock & local building stone
Ironstone	“	Local	Where does the iron come from? & local building stone
Bunter quartzite	Permo-Triassic (derived)	Erratic, Midlands	Metamorphism (‘cooked’ sandstone) & glacial ice transport
Bunter quartz	“	“	Igneous rocks & glacial ice transport
Gabbro	Eocene?	Erratic, Northern England	Igneous rock & glacial ice transport

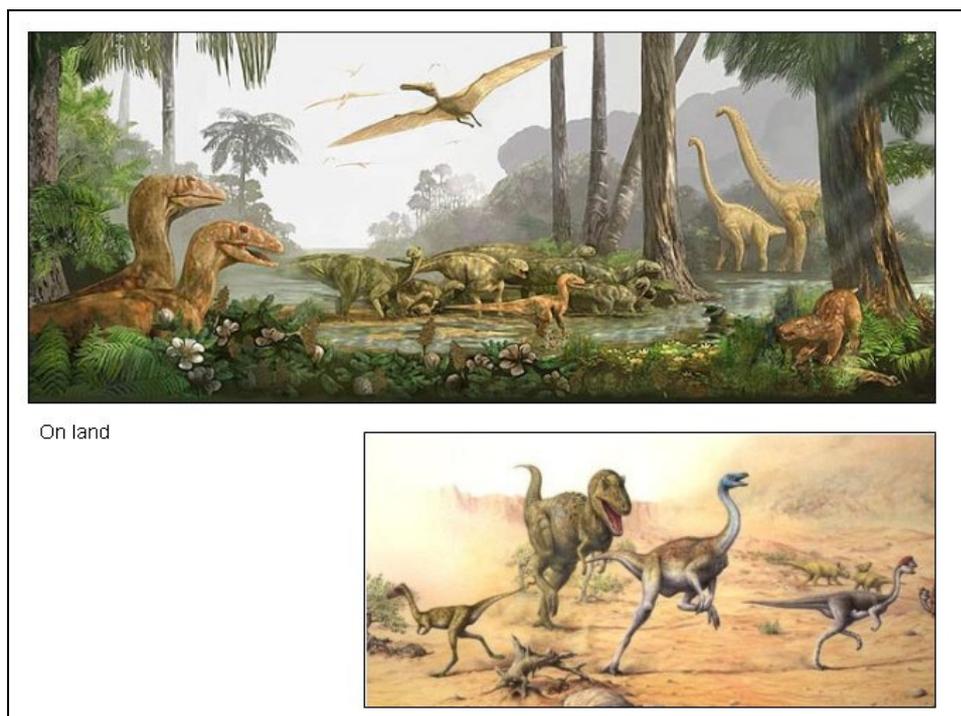
Basalt	Eocene?	Erratic, Scotland	Igneous rock & glacial ice transport
Boulder clay (till)	Ice Age	Fenland basin	Glacial ice transport
Ostrea fossil	Upper Jurassic	Fenland basin	Glacial ice transport

A colourful visual presentation was prepared in MS 'Powerpoint' format. This covered the following points:

- Introducing geological time. Time can be conceived as a line (one cm = 1 year) which allows us to visualise remote prehistory. The end of the last Ice Age is 100 m away (*end of playground*); 1 million years is 10 km (*as far away as King's Lynn*); 80 million years (time of the Dinosaurs, when the local chalk was being deposited) is 800 km (*as far away as Italy*).
- Introducing the local geological map (how geologists see the world).
- The variety of local rocks I found, and where they come from (local and further afield).



- Cretaceous & Jurassic rocks in Norfolk; what the Earth looked like then (land and sea life).



- The local bedrock is tilted. How did mountain building in the Alps affected Norfolk?
- Ice Age rocks in Norfolk. How did a variety of erratic rocks (including igneous) get here?

And erratic rocks from further afield ...



Igneous rock



Basalt and Gabbro from Scotland or Northumberland  
(early Tertiary lava - 55 million)



I augmented the interpretive potential of the local specimens by supplementing them with other specimens with interpretive potential, e.g. unweathered flint nodules.

### Session delivery

An hour was allocated. The classroom was quite small, so space was at a premium. It was equipped with chairs and low tables. I stood next to the projector screen near a table with the specimens. The session fell into two parts:

- Visual presentation (c. 20 minutes), assisted by specimens. The children were sitting cross-legged on the floor looking at the screen.
- Practical session (c. 40 minutes), including handing around specimens and looking at pupils' specimens and discussing them. The children were seated in a rough circle.

At the end of the session I asked Linda Preston for any feedback. She said she thought it had gone well – see Appendix. She had not appreciated that she could use the west Norfolk chalk scarp to exemplify a range of hills relating to mountain building. She said she hoped another visit from me could be arranged next year.

### Evaluation

#### Visual presentation

- The children were quietly attentive, occasionally asking questions or expressing interest in various ways. I was concerned that some of them could not see the board easily.
- I was concerned that some of the content might be too advanced for them, but I got no indications that this was the case apart from raised eyebrows when the words 'Sedimentary', 'Igneous' and 'Metamorphic' were mentioned on one slide. From this I deduced that they were not familiar with their meaning, so I didn't take them any further in this direction.
- The pictures of Cretaceous land and sea life were well received. A lot more work could be done with comparing marine biodiversity then and now (e.g. turtles and corals today, but no plesiosaurs and ammonites).
- During the presentation, I handed out specimens to illustrate certain points. This was done a bit haphazardly, and may have pupils' distracted attention a bit. On the other hand it allowed me to reinforce certain geological words with the presentation of corresponding examples.

### Practical session

- Pupils were at ease with discussing chalk, flint and sandstone. I would have liked to have been able to spend more time explaining the igneous erratics, in order to link up better with mountain building and volcanoes theme.
- Space to organise and present my specimens was at a premium. They were organised in separate boxes, but a single tray with named / numbered compartments would have been ideal.
- Pupils approached me to show their specimens. This was a key part of the session, which could (in hindsight) have been better organised and could perhaps have lasted at least 10 minutes longer. This is because there was a rush towards the end by those who had not yet had their finds examined. I hope I did them justice individually. Unsurprisingly, many pupils brought flints, and a fair number brought bits of local sandstone. One pupil brought a lump of what I think was Mountsorrel granite, a specimen of igneous rock of Precambrian age from Leicestershire, so by far the oldest specimen seen (over 600 million years); it had a patch of tar on it, so probably picked up off the road surface. Much could have been made of this find, given more time.
- By the end of the session all pupils were holding specimens. Some asked why there were numbers on some and I explained that these were my collection numbers. This brought up the idea of collecting. Some had evidently brought favourite or pet stones which they were already privately curating; others just brought whatever specimen had come to hand on the day. It would have been interesting to have asked the reasons why they chose their specimens, and from this attitudes to valuing the physical environment could have been explored. The range of responses to specimens was interesting. Some pupils related to them purely in aesthetic terms, like patterned works of art, while others saw them as potential tools or as prompts for flights of imagination.
- Humanly-worked flints were not discussed, as I had not found any during the research field trip. This is a potential area for future work, linking the chalk landscape with prehistoric human life and settlement. Need to check the evidence in the Gaywood river catchment?

On balance, I think the session was good and useful for pupils. It was a good idea to ask them to bring their own locally-sourced specimens, as a way of involving them in Earth science and the story of local environmental change set against geological timescales.

### Possible future lines of session development

- 1) Making more of the pupils' specimens by posting summary on a blackboard, for example:

<i>Chalk</i>	✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓
<i>Flint</i>	✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓
<i>Sandstone</i>	✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓
<i>Ironstone</i>	✓ ✓
<i>Quartz</i>	✓ ✓ ✓ ✓
<i>Artificial</i>	✓ ✓ ✓ ✓ ✓
<i>Fossil</i>	✓ ✓
<i>Volcanic</i>	✓ ✓

This would have demonstrated that their contribution was collectively valued, and would have reinforced what was being discussed.

- 2) Asking where pupils' specimens came from, then relating answers to local landscape using a map or Google aerial photo. This would reinforce pupils' links with and awareness of their localities.
- 3) Asking pupils why they chose their specimens. Likely categories might include:

- Aesthetic / beauty value
- Imaginative value
- Functional value
- Random choice

This would encourage the development of personal responses to stones, and hence linkage with and awareness of the environment.

- 4) Introducing differences between a) Cretaceous, b) Ice Age and c) present day wildlife using specimens and pictures. This would encourage understanding and valuing of present biodiversity set against the story of environmental change and extinction.
- 5) Introducing examples of flint tools and their links with local prehistoric human life. This would encourage understanding of the depth dimension of human existence and the development of culture. It relates to new prehistoric content in the National Curriculum.
- 6) Using fossils and pictures to draw out the theme of climate change, by contrasting the Cretaceous hothouse world with Pleistocene Ice Age world, and both with likely future climate change scenarios. This would introduce the theme of natural vs. human-induced climatic change.
- 7) Collecting rocks and stones on a field trip to the Gaywood valley, and then having the geological session in the classroom afterwards (rather than before, as happened this time). This would make the local environmental linkages more explicit for pupils, and give the field trip an added practical focus.

## APPENDIX

Comments received from Linda Preston by email, 1-5-2014

Both the children and myself thoroughly enjoyed and learnt a lot from our session with you. You had obviously spent a lot of time and effort planning the activities and ensuring that everything was pitched at an appropriate level for my class of Year 3 (rising 8 year old) children. The quantity and variety of specimens that you provided and the pictures of how Norfolk might have been in the Cretaceous and Jurassic periods were fascinating and led to much discussion and many questions, which you answered with great patience! The children were also fascinated to discover more about the rocks and stones that they had brought in from home and how they came to be in our local area. The whole session was very useful in supporting our science and geography curriculum and certainly inspired and informed a better understanding of the local geology and how the landscape had developed. Furthermore, many of the children went home and told their parents that they wanted to be geologists when they grow up!

Tim Holt-Wilson  
 Norfolk Geodiversity Partnership  
 timholtwilson@onetel.com  
 26-3-2014



The Norfolk Geodiversity Partnership is a forum for conserving Norfolk's Earth heritage  
<https://sites.google.com/site/norfolkgeodiversity/>