



FLIGHT AT KS1 (CROSS-CURRICULAR TOPIC)

SESSIONS 2, 3 AND 4: THE STORY OF THE MONTGOLFIER BROTHERS' HOT AIR BALLOON

The teaching took place in an Exeter First School with a split Year 2/3 class. The older Year 3s formed a full class next door, while the younger Year 3s were in with the Year 2s. I worked with the class for a full morning a week over five weeks.

Andrea, the class teacher, had chosen the cross-curricular topic of 'Flight'. We planned the teaching together, to include science, history and technology, as well as literacy, particularly speaking and listening. We were going beyond the official science curriculum. The history element of the teaching was done mainly through storytelling. The stories ranged from myth (the story of Icarus) to Amy Johnson's solo flight from England to Australia. The idea was to give the children an overview of the development of flight, while also going into depth with the storytelling about a few special flying events.

This account describes the second, third and fourth sessions of the topic. In these sessions we moved forward in time to the eighteenth century, and the Montgolfier brothers' hot air balloon.

Class/Year group and Time

Year 2/3, mixed gender and ability, 29 in the class. The Year 2's were in the majority. Three whole morning sessions.

Learning objectives

For the children to:

- learn about a famous past event (history)
- learn that hot air is lighter than cold air – it rises (science)
- design and make model hot air balloons (design & technology)

Key question

Why did the Montgolfier brothers' balloon fly?

Resources

The story of the Montgolfier brothers' hot air balloon. This is available in libraries and topic books. See also, for detailed history and explanation, plus pictures:

http://en.wikipedia.org/wiki/Hot_air_balloon

http://en.wikipedia.org/wiki/Montgolfier_brothers

www.start-flying.com/Montgolfier.htm

BBC Watch video of the story of flight

Large black bin bag

Hairdrier (this would need to be approved before use)

Balloons (one per child), balloon pump, tissue paper, card, string, scissors, cooking oil.

Health & Safety

Carry out your own risk assessment and take suitable precautions. Do not rely on what is said here.

The teaching

Episode 1

Focus: Participatory storytelling – the Montgolfier brothers' hot air balloon.

We sat the children down and briefly recapped, in outline, people's previous attempts to fly like birds. We also revisited the concept of air. We then showed the first part of the WATCH video, up to the 18th century. This reinforced some of the concepts we had discussed in the first lesson (see the Icarus lesson – *Flight* lesson 1).

Then I told the story of the two Montgolfier brothers' successful experiments with hot air balloons in 1783. I broke off to show the WATCH video's section about the Montgolfiers' hot air balloon.

The Montgolfiers first succeeded in flying an empty balloon. Next they sent up three animals: a rooster, a duck and a sheep. The balloon had a circular gondola beneath it, with a smoky fire in its centre and space for the animals around the sides. All three animals survived the flight safely.

This was a role-play opportunity not to be missed. We chose three children to be the duck, rooster and sheep, and they animated the story by making all the right noises as the balloon took off in our imaginations and soared into the sky of France.

This was a huge success, far more interesting to the children than the subsequent flight, in which two men became the first people ever to fly – they stayed aloft for 25 minutes.

Episode 2

Focus: Scientific demonstration that hot air rises.

Now we moved on to demonstrate the principle underpinning the Montgolfier brothers' balloon (not that they themselves realised what it was – they believed it was the smoke that made their balloon fly).

We brought out the hairdrier and bin bag. Andrea chose five children to hold tight onto the open edge of the bin bag. I plugged in the hairdrier, asked the bin bag holders to make the opening into a circle, then carefully blew hot air into the bin bag with the hairdrier.

The bin bag rose up immediately into the air, and the children had to hold on tight to stop it flying away. In groups, we gave the rest of the children a turn to hold the 'hot air balloon' too.

We asked the last group to let go. The bin bag balloon flew up to the ceiling - then, as the air inside it cooled, it collapsed and floated down to the floor. This was a simple yet very effective demonstration that hot air rises.

Episode 3

Focus: Technology – designing and making model hot air balloons.

Back in the classroom after morning break, we asked the children to design their own hot air balloons. I had brought in 14 topic books with hot air balloons illustrated. The children pored over them and drew their balloons.

Meanwhile Andrea and I blew up the party balloons with the pump and set them on cardboard stands – these were to be the moulds for the children's hot air balloons.

We now poured cooking oil into each child's hands so they could spread it over their balloons – this prevented the tissue paper from sticking onto the balloons. Once their balloons were well-oiled, the children began gluing layers of tissue paper over the balloon moulds. This messy process carried on until the end of the lesson.

Sessions 2 and 3

Session 2. For the whole of the following week's session the children continued and completed their hot air balloons. Andrea showed them how to fold card into a box shape, to make baskets hanging below the balloons.

While the children worked, I withdrew two children at a time for some timeline work. I had collected fifteen pictures of different attempts to fly, and of flying machines and machine designs including aeroplanes. The pictures ranged from 3,000 years ago to the present and included several the children hadn't seen.

I pinned a string and pegs along the wall and pegged along the string, in the right places, cards saying: 3,000, 2,000, 1,000, 500, 200, 100 YEARS AGO, and finally one saying NOW. I asked each couple to use the pictures to show – and tell – me how they thought the story of flight had developed. They had the option either to use the string and pegs, or to arrange the pictures on a table. I had time only to work with ten children, five from Year 3 and five from Year 2.

This was a useful exercise to assess the children's chronological understanding. In general, all ten children showed a good grasp of the development of flight. A Year 2 boy chose just one picture out of chronological sequence. The main differences between the children were in their ability to explain their choices and tell the story. As expected, the Year 3's were noticeably more articulate than the younger children. They also tended to use more of the pictures and make links from one development to the next.

Session 3. The third hot air balloon session was pure serendipity. I discovered that the owner of a real hot air balloon was coming to give a demonstration at a nearby primary school. The school readily agreed to allow our Year 2/3's to come along on the day to see the show.

When we arrived, the balloon was waiting on the playing field. The children were overwhelmed by its size. The owner filled the balloon and the children watched in awe as it rose into the air (only about 5 metres, as it was tethered to the ground). The roar of the gas, the rippling of the cloth, the huge basket, were all hugely exciting. The sheer size of the balloon and the amount of gas needed astonished the children.

Best of all, the owner gave them a chance to get into the basket and examine it. They questioned him about how everything worked, and were also able to contribute information about the differences between the modern basket and the Montgolfiers', and about the different ways the two were fuelled.

Learning outcomes

The children:

- learnt about a famous past event (history)
- demonstrated chronological understanding of the development of flight (history)
- clearly knew that hot air is lighter than cold air (science)
- were able to make comparisons between the Montgolfiers' hot air balloon and a modern one (science)
- individually designed and made model hot air balloons (design & technology).

Nuffield Primary History project

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