

NATIONAL MUSEUM VAN DE SPEELKAART, TURNHOUT, BELGIUM

Printing: history and technology

Jef Van Den Bosch

Part 1 Basic information

Institutions involved

Museum van de Speelkaart (MSK), Druivenstraat , 18 2300 Turnhout, Belgium. Contact person: Filip Cremers, tel. +32.14.41.56.21.

Katholieke Hogeschool Kempen, Departement Lerarenopleiding Heilig Graf, Patersstraat, 26 2300 Turnhout, Belgium. Contact person: Jef Van Den Bosch +32.14.21.29.26, jefvandenbosch@pi.be.

Primary schools

- *Sint-Pietersinstituut*, Jubileumlaan, 11 2300 Turnhout +32.14.63.99.22.
- *Basisschool Heilig Graf*, Nijverheidsstraat, 11 2300 Turnhout +32.14.47.99.15.

Aims

- Make a visual report of the exhibits of your preference in the museum, by use of a digital camera.
- Give examples of applications of levers, gearwheels pulleys and other objects found in the museum.
- During the museum visit, recognise the most important phases of the history of printing.
- Explain the fundamentals of the steam-engine and how it is used for 'movement'.
- Indicate various inventions on the time scale of western history.
- Test a 'chemical' printing process in a workshop.
- Enjoy the exhibits and have an eye for techniques and materials used in pieces of art and craftsmanship.
- Recognise the different kinds of energy that move the printing machines.

Materials

- digital camera (evt. 3.5 disk when using the Mavica);
- laptop for computer animation;
- safety-helmets, steam-whistle;
- worksheets;
- for the printing-workshop: rectangular water-containers, oil based paint or water based printing ink, turpentine (as a thinner), A3 paper, mixing material, old sheets to dry the work on, old newspapers, brushes, hairdryer, white spirit for cleaning the brushes, appropriate clothing for the workshop.

Part 2 Description of the project

Preparation of the visit: working in corners

Corner 1 The museum-identity card

In the worksheets there's an 'identity card' of the museum. Pupils should find information about the MSK on the internet and brochures. Consequently the pupils present the MSK with its full name, an introduction, a picture, some information on the building where the MSK is located, on practical issues, on its location in the city-map...

Working with the internet there are two possibilities: you know the internet address or you don't know the internet address and you go for a search engine.

Corner 2 Digital pictures and software

Purpose: printing a picture from a 3.5 disk or a memory card.

Example 1: Imaging (3.5 inch).

In dutch: Bureaublad, Start, Programma's, Bureau-accessoires, Imaging, Bestand, Openen, 3.5 inch diskette (A:), Bestand, Afdrukken, Opties (aanpassen indien nodig), Eigenschappen (aanpassen indien nodig), OK, Sluiten.

Example 2: Picture it (3.5 inch).

In Dutch: Bureaublad, Start, Programma's, Picture it, Open and edit, My Computer, 3,5 inch, selected photo's en open, print, print on my printer, standard paper, fit to page, print.

Corner 3 Taking pictures with the digital camera (Sony Mavica or Nikon 4300)

Pupils should take a photograph of each other in order to practice with the camera. Some tasks: charging and placing the battery, placing the diskette or memory card, power on/off, zooming, focusing, review their work on the camera.

Corner 4 Activity sheet on the digital camera

- Show the use of buttons and screens (starting point is the front and the back of the camera, the scheme should be completed later on). The same scheme could be a simple manual for the children.
- Show the use of the screens (menus): how to get into a particular screen, describe the functions with your own words (fi resolution).

Visit to the museum (2 hours)

Organisation

Introduction (15 min). The whole group (20 pupils and the teacher) is informed about the different sections of the museum (old machinery, steam house, playing cards exhibit, workshop area, auditorium) by a member of the staff and is introduced to the museum educator or guide. They also get a short history of the museum.

Work in the museum (5 groups – 5 times 20 minutes). Some of the activities have a complementary character, others are parallel for each group. After 20 minutes pupils get a sign that they should change activities.

Contents and activities

Activity 1 (for everybody) Steam- engine

- Visit with the guide due to safety: pupils learn about the most important parts of the engine and their functions.
- Search on the laptop animation with a CD-ROM: the animation shows in a simple way how the steam engine works.
- Historical movies are projected on the museum-wall.

Some issues: parts of the engine, applications of the engine, transmissions, history of the engine (James Watt, Turnhout).

Activity 2 (for everybody) Interview: how does a museum work?

Many people work in a museum. Interview briefly somebody of the museum-staff about the work and the organisation of a museum. Some suggestions for your questions:

- Who is in charge in the MSK?
- Which are the tasks of the staff: curator, archivist, guides?
- Is everybody paid in the museum for the work done?
- What does the museum collect?
- Why does the museum collect and display these things?
- How do they store and protect things in the museum?
- How do they put the collection on display?
- Are there any new acquisitions?
- How did the museum get these things and how much did they cost?
- Is there a connection between the MSK and the region?

P.S. Take a picture of someone of the museum-staff and one of a recent acquisition.

Activity 3 (complementary) Searching for movement with the digital camera.

Pupils have worksheets with tables that they should fill in. Every group has its own topic: energy, wheels, connections, pressure, gearwheels. They take pictures of the related exhibits. At home and at school they should look for more information on the inventors, the functioning of the machines and so on. There are 5 different issues.

Energy (engines in the museum) Fill in the worksheet

Muscles:

Steam:

Electricity:

Advantages and disadvantages of this kind of energy:

Applications of the wheel

Which engines:

Steam engine - from the horizontal movement of the 'zuiger' to the turning of a wheel:

Applications:

Advantages and disadvantages of the wheel:

Connections (applications, advantages and disadvantages)

Is it fixed or loose?

Which kind of connection (screws, glue...):

How does the connection fit to the material?

Advantages and disadvantages of a particular connection:

Pressure

How?

- screws
- knee-joints
- rolls

Advantages and disadvantages:

Transmissions

How?

From... to...

Materials:

Advantages and disadvantages:

Activity 4 Evolution of the printing process

Pupils can explore the most important steps of the printing technology on the panels in the museum. They have to note the evolution on a timetable. There is a second time table for the history of printing in Turnhout which should be filled in. In case they do not have enough time, they can work on these tasks at school. Pupils should be aware of the advantages and possible applications of the different innovations.

Activity 5 Printing in the museum workshop: 'marbling' on paper

Application on the base of the incompatibility between water and oil.

Work method: some rectangular water containers are on the floor of the room. They are as full as possible. Before starting the oil-based paint (printing ink) is prepared (the paint shouldn't be too thick, otherwise it will sink to the bottom). Turpentine is a good thinner. The pupils start putting drops of paint on the water. If necessary they can spread the paint in a different way with the end of their paintbrush. They should avoid using fingers because they are not as thin as the end of the brushes. Now the pupils put an A3-paper on the water; they press it gently, avoiding the upper part getting wet (otherwise the sheet might fall apart). When the pupils remove the paper they have a 'marbled' sheet. After the paper has been dried fast with a hairdryer, it can be used for other creative applications.

PS. During the museum visit special attention should be given to 'safety' for many exhibits are of a 'hands on' type. The end of an activity is indicated by means of a steam-whistle, blown by one of the pupils doing the interview. This interview should be given on a central location.

Follow-up work in classroom

The pupils work in groups in order to make a presentation of their work (a small exhibition, creating their own museum). This means they have to put their photographs on the computer, print them, make some labels for the pictures, find more information about their research topic: inventors, history, applications... At the end they have to present their work as if they were a 'guide' for their fellow-students.

Conclusions and evaluation

- Pupils enjoy the independent approach in the museum. On the other hand, this type of work needs a lot of manpower: 1 person at the steam engine, 1 person in the workshop, 1 person for the interview. It would be possible to have the teacher conducting the activities in the workshop if these are well prepared (in-service training?).
- The follow up/assimilation activities at school can cause some problems. The computers and the technical and scientific knowledge fail in many cases. As a solution we suggest the creation of a comprehensive manual and a complete set of lessons for class work. This kit could help to find historical sources, internet sites with technical support for children, ready to use timetables, formats that help with the information about an innovation or an inventor. These formats should also help to build a well-structured presentation of the pupils' projects.

Facilitators and innovative aspects

- In Flemish primary schools a museum visit often becomes a strictly guided visit. The preparation is only focused on practical things. Most of the museum visits are a "cultural happening". Especially the big and famous art museums, which have an old tradition in Flanders, are "a must" in the curriculum. When there is a technical and scientific approach – a privilege for secondary schools-teacher choose institutions such as Technopolis in Mechelen or the Natuurhistorisch Museum in Brussels.
- The MSK brings the issue close to the school gates. The small scale of the museum gives great opportunities. The museum becomes an extension of the classroom in which working in small groups is followed by instruction for a small number of pupils. The use of the digital camera adds an important ICT component to the museum visit.
- The follow up of the museum visit in the class is essential. Working on different issues opens up for the use of various search tools: computer, internet, artefacts, written sources. The presentation in a small exhibition stimulates the creativity of the pupils and offers an excellent environment for learning.

Appendix

- Activity sheets.