Education and Culture
Lifelong learning programme
COMENIUS

MINUTE FOR GROUP WORK
COMENIUS School Partnerships

"European CNC-Network – Train for EUROPE – RELOADED"

Meeting Description	First Project Meeting in Zagreb (Croatia)
Meeting hosted by	I.tehnička škola TESLA

Date / Time / Place	Friday, 18th November 2011, Room No. 118
Name of Workline	Workline B - Wagon Components
Name of Workgroup	Wheel Design

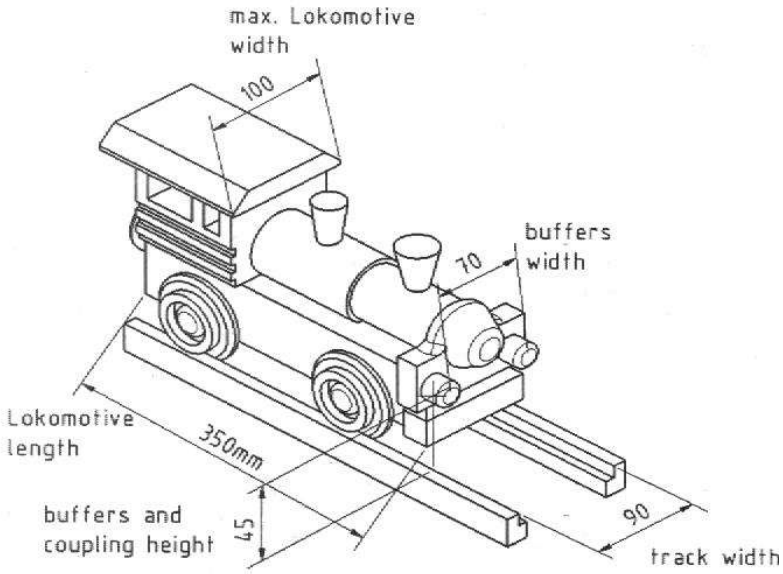
Representative workgroup member	[IR] John O'Neill
Co-representative workgroup member	[IT] Michele Agati
Co-representative workgroup member	[HR] Boris Vuksic

Further workgroup members	[HR] Gordana Eric
	[SK] Eva Kantorakova
	[HU] Ferewc Gal
	Students from above schools

Minute written by	[IR] John O'Neill

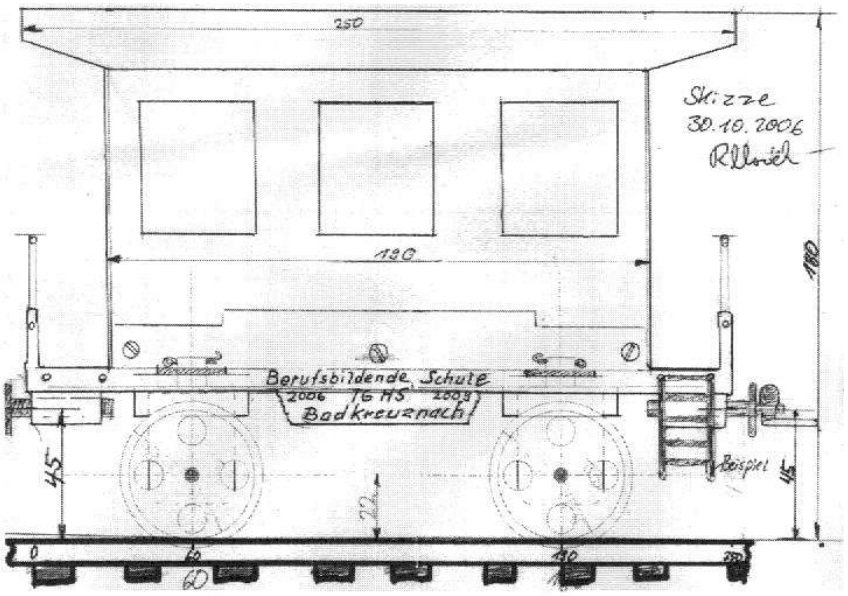
Description of work progress: Topics / Tasks / Results / Decisions / Facts of importance	**Responsible school(s) or person(s) incl. deadlines**
To assist us with our discussions we were given a copy of the drawings from the previous project. Since the scale is similar, as per the resolution, we decided to recommend that the new wheels should be the same overall size, i.e. 50mm outside diameter and 10mm wide.	All
A number of participants from various schools were having difficulty using English to contribute to the discussions so we split up the task as follows:	John O'Neill
Friction between wheels and track - Ireland	Oisin Lyons
Technical design - Hungary	Ferewc Gal
Overall design - Croatia	Boris Vuksic
Aesthetic design - Slovakia	Eva Kantorakova
Steering system - Italy	Michele Agati

DIMENSIONS LOCOMOTIVE

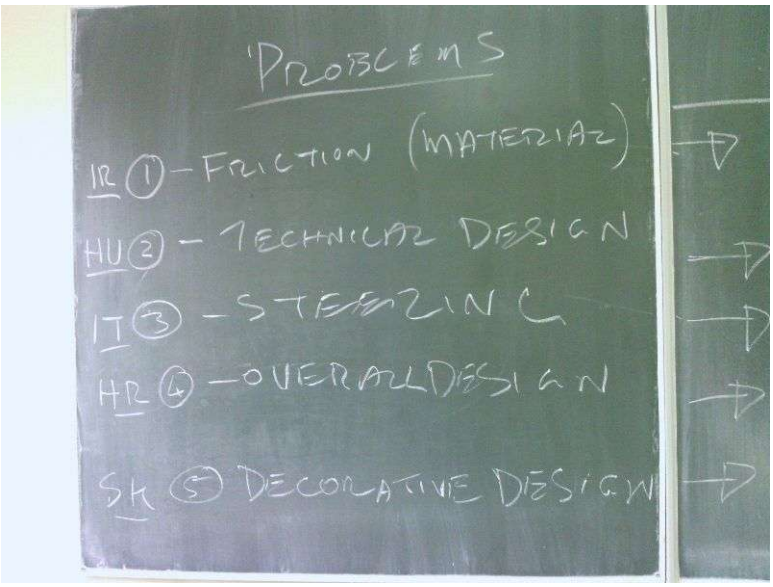


School on the way to Europe

DIMENSIONS WAGON



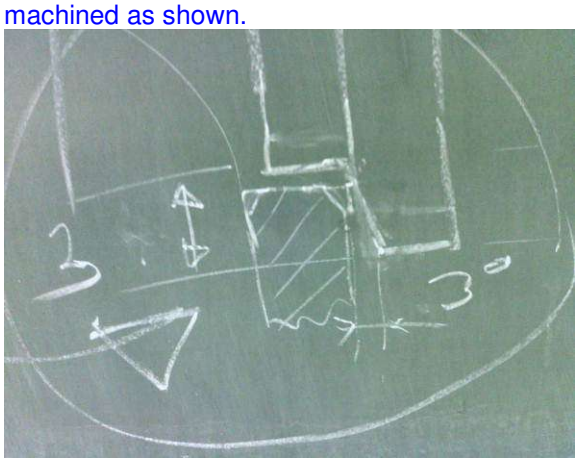
School on the way to Europe



The Irish team looked at the question of friction from both a positive and negative point of view. Positive, because the greater the friction between the Locomotive wheels and the track the better. Negative, because the less friction there is between the Carriage and the track the better that is.
Their recommendations are as follows:
Locomotive wheels should be made of Cast Iron because this material has good machinability and a high co-efficient of friction.

Carriage wheels should be made of Nylon or Acetal (plastic) because of its lightweight, machinability, low co-efficient of friction and low cost. Where budgets allow, Brass could be substituted for its asthetic appeal. In some cases Aluminium might be preferred, but its high friction and wear rate make it the least suitable of the four materials mentioned.

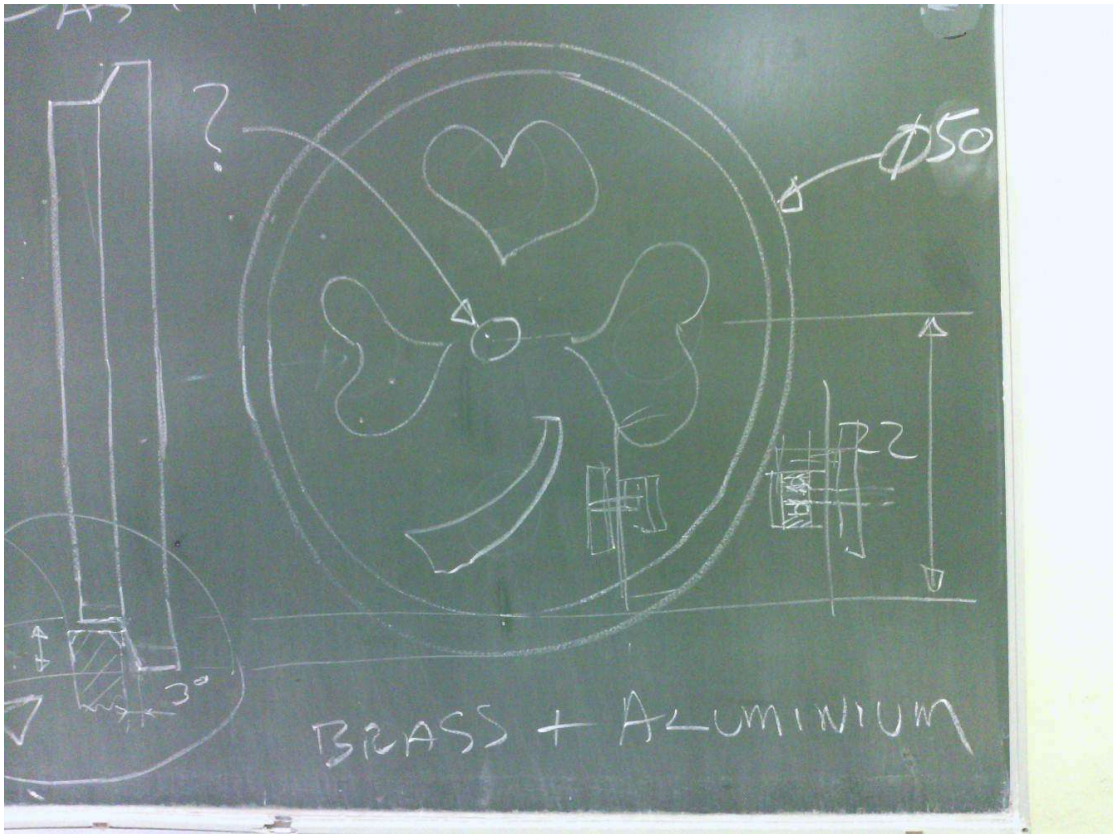
The Hungarian team discussed the technical design of the wheel in contact with the track. We were fortunate to have a sample wheel from the last train, supplied by Goga, to help with the discussion. The stepped detail was identified as a possible problem and it was recommended that a 3 degree taper be machined as shown.



The Croatian team had responsibility for the overall desingn of the wheel. They had the sample wheel from the previous project. The assumption was made that the track would remain as is, so there seemed no need to change the basic design of the wheel. Boris Vuksic wrote the following on the forum:
Brainstorming: Students had many interesting ideas. With little help of teachers group decided few "rules".

1. Dimension of the wheels should remain same as on train 1.
2. Wheels should have bearings to allow each wheel to turn in (at) different speed to avoid wagon jump out of tracks in the curves.
3. Asthetic design of the wheels should be had done by each country. When deciding about asthetic design we should be careful so bearings can fit in the wheel and structure of the wheel should be tested for stress.
4. Materials: Aluminium or Nylon or Brass for WAGONS
   Cast Iron for LOCOMOTIVE

The Slovakian team discussed the asthetic design of the wheel and confirmed the earlier recommendation that each country would be allowed to apply their own design detail. However, they were careful to point out that the asthetic design must not be at the expense of the technical design. In other words, the FUNCTION of the wheel should take priority over its FORM. John [IR] suggested a shamrock design for the Irish wheels as shown.



The Italian team discussed the steering system that might be used on the Locomotive and Wagons. Their discussion was carried out at the same time as the others and therefore they did not know about the plan to allow each wheel to run independently on the axles. When this was later discussed the Italian team agreed that there was probably no need to have a seperate steering system.

We also had the benefit of hearing the plans of the Track Design group who were working in the classroom next door. They were recommending that the size of the track be changed and this was of some concern to us because it might mean an enforced changed to the wheel design. We questioned the need to change the overall size of the track??