

Germany

Education Tour 2016



The Chinese Foundation Secondary School
The Hong Kong Special Administrative Region of the People's Republic of China



**What We Have Learnt
from
Germany Education
Tour 2016**



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Mr. AU Kwong Wing

With great pleasure, I would like to introduce to you the recent trip to Germany that has encapsulated the recent learning and experience of our students and staff .

First and foremost, on behalf of the staff and students of the German Tour, I must express my heartfelt gratitude towards our School Supervisor, Dr. Annie S.C. Wu without whom this trip would not have taken place. Her tireless commitment to education and full sponsorship have made this trip a reality. The Germany Trip harmoniously echoed our Global Awareness Program (GAP). GAP is a programme dedicated to promoting global awareness and the equipping students with 21st century skills in order to surmount challenges in the world becoming increasingly inter-connected both economically and culturally. The education tours under GAP are meant to broaden our students’ global perspective, heighten their appreciation of diversity and bringing science & technology to their life. Special thanks are also due to Dr. Wu’s invitees, Dr. Carl Hahn and Mr. Fred Dube, as Advisors of International Mentorship Programme. Both learned persons boast a wealth of international experience from their International business, multi-cultural management and academic research to mentor our students. Let me take this opportunity to thank them for their generous support in providing advice and guidance to our students.

The Germany Education Tour is composed of five main areas of learning, namely Germanic culture, modern and earlier European History, Germanic business management practices, biodiverse environment in Germany and Germanic general etiquette including that involving diplomatic mission.

Under the different styles of European architecture, from Gothic, Baroque, Rococo and Neo Classic genre, students conducted street surveys in German cities and interacted with the locals. A broad perspective of the European history was formed from their series of museum visits to The Pergamon Museum, The Neues Museum, The Dachau Concentration Camp, Holocaust Memorial and The Berlin Wall, etc. Likewise, inspirations were brought to the students and teaching staff from their visits to corporations that operate multinational arena. Their visits to giants such as Munich-Re, Roland Berger and LSG Sky Chefs helped foster an understanding of the essence of Germany management practices. Germany’s effort in maintaining biodiversity through preservation and conservation of endangered species in flora and fauna had given our visiting team a lot of inspirations. Their widespread use of renewable energy sources such as wind and solar energy has been made possible through their highly developed technology, all of which served to stimulate our delegates’ imaginations. Visits to the Embassy of the PRC in Federal Republic of Germany and Consulate General of PRC in Munich were also arranged. Our students were given an exposure of how the Chinese diplomatic mission works as well as a chance to learn how to behave on different occasions.

Through this trip our students were able to meet locals from all walks of life, both formal and informal. Invaluably, this is just a very quick preview of what our delegates have done. No doubt, it would be much more interesting to read about the in-depth accounts of their reports from their visit. I also hope that you will find their compilation thought-provoking and that you will generously give us comments and suggestions you may have on the reports of our delegates.

Thank you in advance and happy reading!

23 Mar (Wed)	Depart for Germany
24 Mar(Thu)	Visit Embassy of the PRC in Federal Republic of Germany Visit German Research Centre for Geosciences
25 Mar (Fri)	Visit Berlin Wall Visit Reichstag Dome Visit Brandenburg Gate Visit Holocaust Memorial Visit Berlin Cathedral Visit The Museum Island
26 Mar (Sat)	Visit Berlin Zoological Garden Visit Kaiser Wilhelm Memorial Church Visit German Technology Museum
27 Mar (Sun)	Visit Dresden (Theaterplatz, Zwinger Palace, Bruhl’s Terrace, Dresden Frauenkirche) Visit Nuremberg (St Lorenz Church)
28 Mar (Mon)	Visit Dachau Concentration Camp Visit Munich Botanical Garden Visit Deutsches Museum Visit Munich Frauenkirche Visit St. Michael’s Church
29 Mar (Tue)	Visit Audi Plant and Museum in Ingolstadt Visit the Consulate-General of PRC in Munich Conduct Survey on streets
30 Mar (Wed)	Visit Munich Re Group Visit Roland Berger Visit LSG Sky Chefs Munich Depart for Hong Kong
31 Mar (Thu)	Arrive at Hong Kong

Culture



Culture makes people understand each other better. And if they understand each other better in their soul, it is easier to overcome the economic and political barriers Paulo Coelho

Culture

The culture of a place can be reflected in different forms. It shows the characteristics and knowledge of a particular group of people, defined by everything from language, religion, cuisine, social habits, music and arts. It is also the shared pattern of a group learned by socialization.

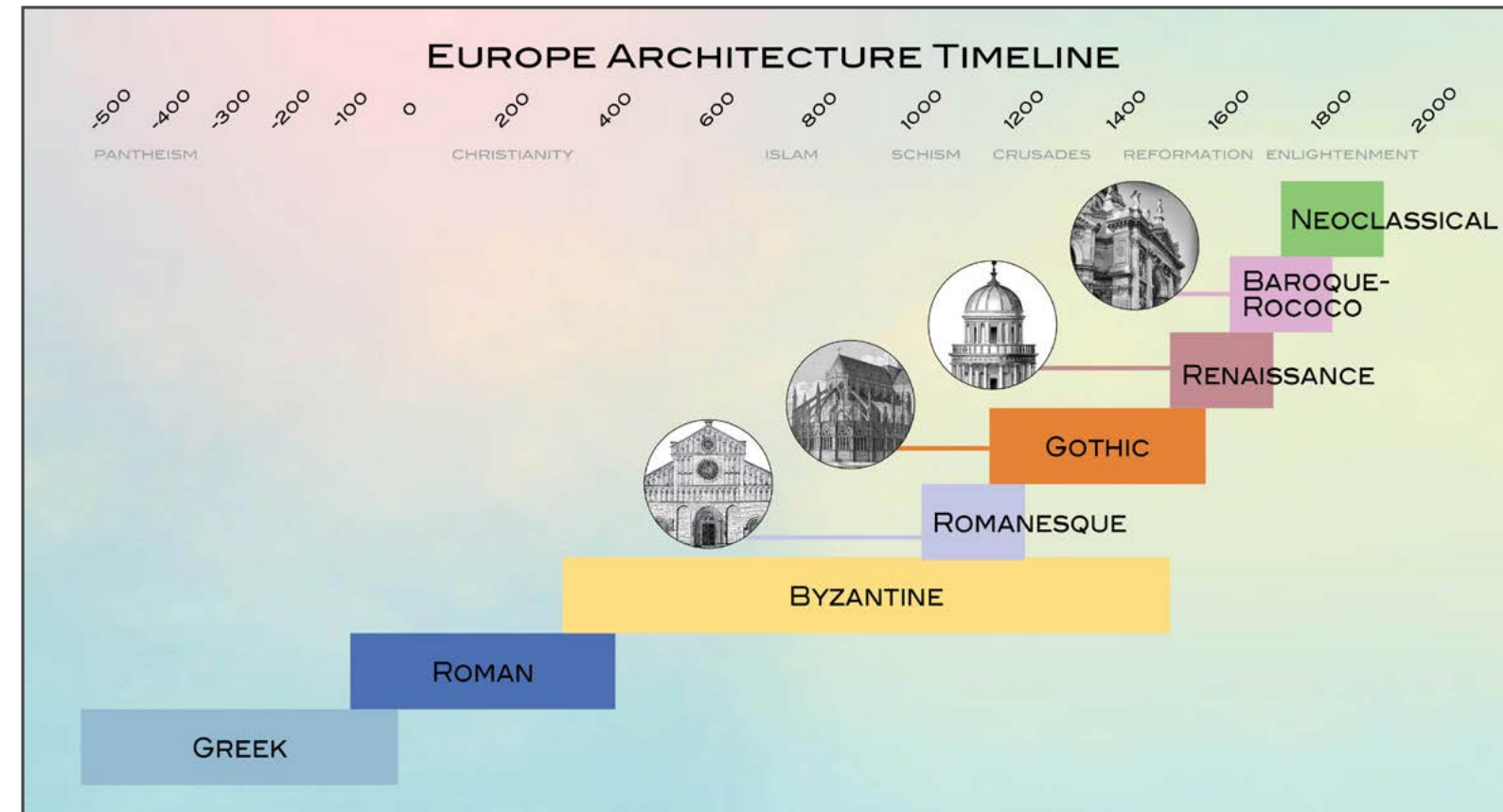
During the tour, we were able to learn the Western culture, and German culture in particular, through observation and conversation. We visited museums, churches and cathedrals of different architectural styles. We saw graffiti on the walls and buildings while statues and sculptures are commonplace in the streets. We encountered street performers and living statues. We sampled traditional German dishes. Apart from these, we were able to get in touch with the locals directly through a survey in the street in Munich. All of these provide firsthand information and unforgettable experience when compared with mere reading of textbooks and guidebooks.



Architecture

An architectural style is characterized by its features that make a building or other structure notable or historically identifiable. A style may include such elements as form, method of construction, building materials, and regional character. Most architecture can be classified within a chronology of styles which changes over time and reflect changing fashions, beliefs and religions, or the emergence of new ideas, technology, or materials which make new styles possible. The history of architectural style can be represented in a timeline from Pre-historic, dating back to 3,050 BC to Neo-modern style in the 21st century.

During the Germany Education Tour, we were able to see a number of churches and cathedrals which mainly fall into five major architectural styles, namely gothic, renaissance, baroque, rococo and neoclassical.



Gothic Architecture 1100 to 1450 AD

Shortly before the middle of the 12th century, a radical transformation of Romanesque forms in the Île-de-France led to the creation of a new architectural style; namely Gothic. This genre of architecture eventually spread to the whole Europe, and even beyond, by the mid-15th century. It succeeded the so-called Romanesque architecture from which it primarily distinguishes itself by extremely light and skeleton-like structure which was possible due to innovations such as flying buttresses and pointed arch. The finest surviving examples of Gothic architecture are religious buildings.

Gothic architecture is most familiar as the architecture of many great cathedrals, abbeys and churches of Europe. It is also the architecture of many castles, palaces, town halls, guild halls, universities and, to a less prominent extent, private dwellings, such as dorms and rooms.

Since the majority of Gothic monuments were religious buildings, the architecture of this period was interpreted according to its religious and symbolic meanings. Medieval texts of a theological, liturgical, didactic or mystical nature frequently dwelt on the notion of a religious building as being the 'house of God', a symbol of His intangible substance, with temporal images of Paradise and of heavenly Jerusalem. Gothic churches provide a formal and a tangible basis to this idea in the vast scale and the incredible height of the cathedrals, as well as in the incredible lightness of the walls, which allowed diffuse, abundant light to enter the space, like the grace of God. The illuminating windows were compared to the precious stones in the walls of the heavenly Jerusalem: the towers recalled those in the vision of St John. To these elements the iconography of sculpture, imagery and stained glass windows were added, arranged in an instructive or mystical series imbued with cosmic symbolism.

This style of architecture developed because of common architectural problems in medieval times. Back in the 1100s-1200s, building skills were extremely limited. Stone castles were rudimentary - dark, cold, and damp. The distinctive features of Gothic architecture are not an absolute novelty in the European panorama of art. Rather, they are the conclusion of a series of previous developments and the solution of several problems left unresolved by the earlier Romanesque style.

The key characteristics of Gothic architecture:

1. Grand, tall designs, which swept upwards with height and grandeur
2. Flying buttress
3. Pointed arch
4. Vaulted ceiling
5. Light and airy interior
6. Gargoyles of Gothic architecture
7. Emphasis upon the decorative style and the ornate

Several buildings including St Lorenz Church, Munich New Town Hall and Munich Frauenkirche are examples of Gothic architectures.

Several buildings including St Lorenz Church, Munich New Town Hall and Munich Frauenkirche are examples of Gothic architectures.

New Town Hall, Munich

The New Town Hall (German: Neues Rathaus) is a town hall at the northern part of Marienplatz in Munich. It hosts the city government including the city council, offices of the mayors and part of the administration. The New Town Hall was built between 1867 and 1908 by Georg von Hauberrisser in a Gothic Revival architecture style. It covers an area of 9159 m² with 400 rooms.

Its elaborate façade rises over a grand arched arcade at ground level. There are statues-galore on the upper storeys – paupers, gargoyles and dragons hustle for attention with kings, dukes, and prince electors.



Elaborate façade and statue-galore

St. Lorenz Church, Nuremburg

St. Lorenz Church (German: St. Lorenz Kirche) is one of the most prominent churches of the Evangelical Lutheran Church in Bavaria. The nave of the church was completed by around 1400. In 1439, work began on the choir in the form of a hall church in the late German Sondergotik style of Gothic architecture. The choir was largely completed by 1477 by Konrad Roriczer while Jakob Grimm completed the intricate vaults. St. Lorenz Church is 80 metres in height.

St Lorenz Church demonstrates a Gothic architectural style with its height. New building techniques (such as the flying buttress which can effectively spread the weight of the new designs, taking the weight off the walls and transferring force directly to the ground) enabled architects to spread the weight of taller walls and loftier towers. Gothic architectures tend to be tall structures. This allows them to reach up to the heavens, which is perfect for cathedrals and churches. Also, there are recognizable twin spires at the top of the church and figurines on the building.

The Church demonstrates pointed arch in the interior. The pointed arch effectively distributed the force of heavier ceilings and bulkier designs, and could support much more weight than previous, simple pillars. The stronger arches allowed for much more vertical height, too. They literally reached up to the heavens.



St. Lorenz Church is a tall structure with twin spires at the top



Figurines on the building

Munich Frauenkirche

The Frauenkirche (Full name: German: Dom zu Unserer Lieben Frau, English: Cathedral of Our Dear Lady) is a church in the Bavarian city of Munich that serves as the cathedral of the Archdiocese of Munich and Freising and seat of its Archbishop. It is a landmark and is considered a symbol of the Bavarian capital city.



Munich Frauenkirche as a late-Gothic architecture

The Frauenkirche was constructed from red brick in the late Gothic style within only 20 years by Jörg von Halsbach. For financial reasons and due to the lack of a nearby stone pit, brick was chosen as building material.

The two towers (north tower 98.57 m, south tower 0.12 m less) were completed in 1488 and the church was consecrated in 1494. However, due to lack of funds, the planned, tall, open-work spires typical of the Gothic style could not be built and the towers had to stay unfinished until 1525. However, because rainwater was regularly penetrating the temporary roofing in the tower's ceilings, a decision was made to complete them in a budget-priced design. This is how the building got its famous domes atop each tower and the church became such a non-interchangeable landmark.



The famous dome at the top of Munich Frauenkirche



Students taking a look at the model of the whole city of Munich

Renaissance Architecture

1400 to 1600 AD

A return to classical ideas ushered an “age of awakening” in Italy, France, and England. Andrea Palladio and other builders looked the classical orders of ancient Greece and Rome.

Although the Renaissance flourished in Italy ca. 1400-1600, it only diffused across the rest of Europe during the latter half of this period. Outside Italy, the transition to the Renaissance was slowed by devotion to the Gothic style. Consequently, much non-Italian Renaissance architecture embodies a fascinating blend of Gothic intricacy and verticality (including towers) with Renaissance simplicity and restraint.

The leading region of Renaissance architecture in northern Europe was France, where the primary building type was the chateau (country mansion). The influence of French Renaissance architecture diffused across northern Europe. Although the continuing demand for monumental religious art meant that most architectural projects involved cathedrals, basilicas, churches, chapels, sacristies, baptisteries, temples and tombs, Renaissance architects also designed a wide range of secular structures, such as palaces, villas, libraries, hospitals, piazzas, fountains, and bridges.

Renaissance architects rejected the intricacy and verticality of the Gothic style for the simplicity and balanced proportions of classicism. Rounded arches, domes, and the classical orders were revived. This revival was accomplished through direct observation of Roman ruins, as well as study of the treatise *Ten Books on Architecture* written by Roman architect-engineer Vitruvius.

Renaissance architecture tends to feature planar classicism (i.e. "flat classicism"). The walls of a Renaissance building (both exterior and interior) are embellished with classical motifs (e.g. columns, pilasters, pediments, blind arches) of minor physical depth, such that they intrude minimally on the two-dimensional appearance of the walls. The walls of a Renaissance building serve as flat canvases for a classical veneer. This contrasts sharply with Baroque architecture, in which walls are deeply curved and sculpted (resulting in "sculpted classicism").

Renaissance architecture developed during the rebirth of Classical art and learning in Europe and evolved through several periods. It was initially characterized by the use of the following features:

1. Classical orders, round arches, and symmetrical proportions. It represented a return to the models of Greco-Roman antiquity and was based on regular order, symmetry, and a central axis with grandiose plans and impressive facades.
2. Silhouettes were clean and simple, with flat roofs replacing Gothic spires. Walls of large dressed masonry blocks gave buildings an imposing sense of dignity and strength.
3. Horizontality is the emphasis. Semicircular arches appeared over doors and windows and in freestanding arcades.
4. Columns were used decoratively on facades and structurally in porticos, and ornamentation was based on pagan or Classical mythological subjects.

Several buildings including St Michael's Church and Reichstag Building are examples of Renaissance architectures.

St. Michael's Church, Munich

St. Michael's Church is the largest Renaissance church north of the Alps. The style of the building had an enormous influence on Southern German early Baroque architecture. The church was built by William V, Duke of Bavaria between 1583 and 1597. The church is 78.2 meters long, 20.3 meters wide and 28.2 meters high.



St. Michael's Church is built with classical structure which emphasizes horizontality.

The facade is impressive and contains standing statues of Duke Wilhelm and earlier rulers of the Bavarian Wittelsbach dynasty, cast in bronze, in the form of a family tree. Hubert Gerhard's large bronze statue between the two entrances shows the Archangel Michael fighting for the Faith and killing the Evil in the shape of a humanoid demon.



The interior is a representation of the triumph of Catholicism as true Christianity during the Counter-Reformation. The heavily indented chancel arch as well as the short side aisles and even the side chapels are designed as a triumphal arch to ancient model. It also demonstrates high altar.



High altar inside St. Michael's Church



The column found in St. Michael's Church shows delicate facades.

Reichstag Building, Berlin

The Reichstag Building (German: Reichstagsgebäude; officially: Deutscher Bundestag - Plenarbereich Reichstagsgebäude) is a historical edifice in Berlin. It was constructed to house the Imperial Diet (German: Reichstag) of the German Empire. It was opened in 1894 and housed the Diet until 1933, when it was severely damaged after it was



A group photo outside the Reichstag Building

set on fire. Until after German reunification on 3 October 1990, it underwent a reconstruction led by architect Norman Foster. After its completion in 1999, it once again became the meeting place of the German parliament: the modern Bundestag.

The Reichstag dome is a large glass dome with a 360 degree view of the surrounding Berlin cityscape. The glass dome was also designed by Foster to be environmentally friendly. Energy efficient features involving the use of the daylight shining through the mirrored cone were applied, effectively decreasing the carbon emissions of the building. The futuristic and transparent design of the Reichstag dome makes it a unique landmark, and symbolizes Berlin's attempt to move away from a past of Nazism and instead towards a future with a heavier emphasis on a united, democratic Germany.



The Reichstag Dome

Baroque Architecture

1600 to 1830 AD

During the 17th century, Europe witnessed scenes of terrific contrasts. The horrific Thirty Year's War was raging (1618-1648) and the populace was besieged by fighting and religious conflict. Those who held the reigns of power devoted vast amounts of energy and resources to the display of their authority; whether royal or papal. Art and architecture were seen as the most effect means to display superiority and the illusionary, propagandist representation of a vibrant and magnificent era that encompassed the Baroque period.

The Baroque period was one of the most exciting times for European architecture. During this period, from the end of the 16th century to the dawn of the 18th century, European architecture exploded in novel directions. Rather than designing a single building, an architect might be responsible for reimagining a complex of buildings, or even planning an entire city.

Though Baroque architecture found its way across Europe, two countries came to the fore in this field: Italy and France. Baroque architecture got its start in Italy and is still evident today at the Vatican in Rome. This new architectural form reached its apex in France. Its mark can be seen quite clearly in Paris, but its purest expression can be found in that most Baroque of all buildings, Louis XIV's palace at Versailles.

The key characteristics of Baroque architecture:

1. Heavy but curved lines in furniture
2. Completely over the top decorations
3. Often religious themed
4. Gold everywhere
5. Massive mirrors whenever possible
6. Frescos on the ceiling
7. A chunky, symmetrical looks
8. High domes

Several buildings including Berlin Cathedral and Church of Our Lady are examples of Baroque architectures.

Berlin Cathedral, Berlin

Berlin Cathedral (German: Berliner Dom) is the short name for the Evangelical (i.e. Protestant) Supreme Parish and Collegiate Church (German: Oberpfarr- und Domkirche zu Berlin) in Berlin, Germany. It is located on The Museum Island in the Mitte borough. Its history began in 1465, when the St. Erasmus Chapel on the Spree Island was elevated to the stature of collegiate church by Pope Paul II. Rulers were buried here later. In the 19th century, the ruling family of Germany, the house of Hohenzollern, was living right next door in the Berlin Castle and they thought that Schinkel's rather modest domed cathedral no longer corresponded to the image they wanted to project of their family. King Frederick William IV thus decided that a magnificent cathedral should be built. The cathedral was built between 1893 and 1905 by Julius Carl Raschdorff. The current building was finished in 1905 and is a main work of Historicist architecture of the "Kaiserzeit".



The entire venture was an imperial project, because Berlin Cathedral was to be the main church for Protestants. The massive courtly and memorial church of the Hohenzollern family is inspired by Italian High Renaissance and Baroque designs. The dome reaches a height of 74 metres. Ornate and crowned with an imposing dome, Berliner Cathedral contains the Hohenzollern royal crypt which is the final resting place of, amongst around a hundred others, Frederick William I, Elector of Brandenburg.



The religion-themed sculptures is built outside the cathedral.

Church of Our Lady, Dresden

Church of Our Lady (German: Dresden Frauenkirche) is a Baroque Lutheran building. It is considered an outstanding example of Protestant sacred architecture, featuring one of the largest domes in Europe. George Bähr, Dresden's master carpenter, designed an impressive 95m high Baroque church with a stone dome, 23.5m in diameter, on a square ground plan, measuring 45 by 45 meters.

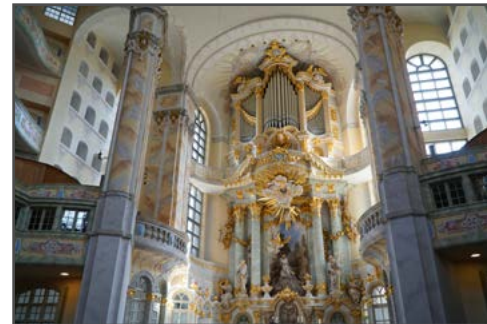


Tall structure with figurines on the building with the symbolic dome at the top



Dresden Frauenkirche with the largest dome in Europe

Construction of the Frauenkirche started in 1726 and the church was consecrated just seven years later. The impressive dome, which became known as the 'stone bell', was finished in 1738 and consists of a double shell with two casings that make up the inner and outer dome. The magnificent church was completed in 1743. Its dome, also the largest north of the Alps, made the church soon become a world-known symbol of the city. The Baroque decorations on the altar show the figure of Christ on the mount of olives. Above the altar is the church organ, decorated with equally sumptuous Baroque ornamentation.



High altar inside Dresden Frauenkirche



Religious-themed frescos on the ceiling of the Dresden Frauenkirche

Rococo Architecture 1650 to 1790 AD

During the last phase of the Baroque period, builders constructed graceful white buildings with sweeping curves. During the Rococo period, forms tended to be enormous and exaggerated, with an increasingly sophisticated play of curves and projections. The harmony of architecture, furnishings and landscape developed significantly during the Baroque period, reaching extraordinary heights with Rococo. These Rococo buildings are elegantly decorated with scrolls, vines, shell-shapes, and delicate geometric patterns.

Rococo is a sub-style of Baroque. There are a lot of overlaps between Baroque and Rococo. In the early 18th century, French aristocrats stopped socializing in the courts and palaces of the kings and started living it up in private mansions. These elaborate party homes were built in a newly emerging style called the Rococo, which embraced intricate, ornate and asymmetrical patterns as well as a sense of lighthearted whimsy and frivolity. Rococo architecture was very popular amongst French aristocrats, and soon this style spread beyond France and into other parts of Europe, notably Germany.

While there are many similarities between the Baroque and the Rococo styles, Rococo buildings tend to be softer and more graceful. Colors are pale and curving shapes dominate.

The key characteristics of Rococo architecture:

1. Elaborate curves and scrolls
2. Ornaments shaped like shells and plants
3. Intricate patterns
4. Delicate details
5. Complex, asymmetrical shapes
6. Light, pastel colors



Zwinger Palace in Dresden

The Zwinger Palace is a typical example of a Rococo architecture.

Zwinger Palace, Dresden

The Zwinger Palace is one of the masterpieces of Matthias Daniel Pöppelmann, first appointed as General Building Superintendent and then subsequently as Court Architect. Situated on the site of the ancient fortress bastions, the Zwinger served as a prestigious arena for festivals, tournaments and games, as well as an exhibition space.



Rococo style was originated in Paris, Germany and Austria. It is characterized by lightness, elegance and an exuberant use of curving, natural forms in ornamentation.



Elaborate curves and scrolls can be found on the buildings. Plant-shaped ornaments shaped on wall are of intricate patterns.



The Rococo style emphasizes fine details.



Over-the-top decorations of the Zwinger Palace



Rococo tend to be enormous and exaggerated. There are more public spaces look out onto a terrace with a panoramic view or faced directly into the

Neoclassicism in Architecture

1730 to 1925 AD

In architecture, neoclassicism was the dominant style in Europe during 1750s-1850s, marked by the imitation of Greco-Roman forms. In its purest form, it is a style principally derived from the architecture of classical antiquity, the Vitruvian principles, and the work of the Italian architect Andrea Palladio. Classical architectural models were adapted or referenced in a range of architectural forms, including churches, arches, temple, house, terraces, garden monuments and interior designs. Later, Neoclassical architecture became an international style, each country held some distinct characteristic in their style. In France, Laugier laid the rational and geometrical groundwork for architecture; in England, Neoclassical architecture interweaved with the Picturesque tradition; and Germany, under the influence from France and England, developed a national style with cultural significance.

In form, Neoclassical architecture emphasises the wall rather than chiaroscuro and maintains separate identities to each of its parts. The style is manifested both in its details as a reaction against the Rococo style of naturalistic ornament, and in its architectural formulae as an outgrowth of some classicising features of Late Baroque. Neoclassical architecture is still designed today, but may be labelled New Classical Architecture for contemporary buildings.

High neoclassicism was an international movement. Though Neoclassical architecture employed the same classical vocabulary as Late Baroque architecture, it tended to emphasize its planar qualities, rather than sculptural volumes. Projections and recessions and their effects of light and shade were more flat; sculptural bas-reliefs were flatter and tended to be enframed in friezes, tablets or panels. Its clearly articulated individual features were isolated rather than interpenetrating, autonomous and complete in themselves. The Altes Museum on Museum Island is a typical example of a Neoclassical architecture.



The Altes Museum as a UNESCO heritage site

Altes Museum, Berlin

The Altes Museum (German for Old Museum) is a museum building on The Museum Island in Berlin. The museum building was built between 1823 and 1830 by the architect Karl Friedrich Schinkel in the neoclassical style to house the Prussian royal family's art collection. The historic, protected building counts among the most distinguished in neoclassicism and is a high point of Schinkel's career. Until 1845, it was called the Königliches Museum (Royal Museum). As the first public museum in Germany, the Old Museum opened royal collections to the public. Along with the other museums and historic buildings on The Museum Island, the Altes Museum was designated an UNESCO World Heritage Site in 1999. Since restoration work in 2010/11, it houses the Antikensammlung (antiquities collection) of the Berlin State Museums.



The Latin inscription on the main façade says it all. The building is dedicated to the “study of any type antiquity and of free art”. Two sculptures — Albert Wolff's Lion Slayer and August Kiss' Fighting Amazon — flank the wide outdoor steps to the vestibule supported by the 18 Ionic columns. These in turn are guarded by 18 Prussian eagles on the roof.



The Neues Museum houses the archaeological collections of the Egyptian. Compared with the Renaissance architecture, less sculptures and decoration can be seen.

Experiences in the streets — Observation

Observing is one of the effective ways to understand a culture. During the Germany education tour, our students could see a lot and learn about the German culture. Not only is it the case during visits to museums and churches and cathedrals where the traditions and heritage can be appreciated, but also as simple as a stroll in the streets can students get to know about the lifestyle of the German people deeply.



The statue "A Walking Man" outside Munich Re Group building

Street art and graffiti is commonly seen in Germany, on the walls and on buildings. They come in the form of inscriptions and paintings. Another feature is street performers, particularly human statues, which are statues performed by people who may be doing miming, dancing and drama. Apart from living statues, stone statues and sculptures are found. Sometimes, sculptures are built outside a business building, which carries a symbolic meaning, such as the "Walking Man" of Munich Re Group building, which means "moving ahead". Students also had a chance to taste the signature German dish, the sausage and pork knuckle. To further affirm the beer drinking culture of Germany, pubs and bars can be found everywhere and it is common to see people enjoying themselves, drinking and chatting with each other in the open. There are self-help newspaper vending machines in the streets too. All of these form the German culture.



Pubs and bars everywhere



Self-help newspaper vending machines



Graffiti are common on walls and buildings



Traditional German dish: Schweinshaxe (pork knuckle)



Traditional German dish: Wurst (German sausage) with potato



Street performer



Students are attracted by a living statue

Experiences in the streets — Survey

Apart from visiting museums, churches and cathedrals, our students gained a deeper understanding of the German culture through close contact with the local people. One afternoon, our students formed small groups to carry out a mini-survey in the street in Munich. Students took an active role in approaching the people there and starting a conversation in English. The people they met were mostly German people, and some of them being tourists to Germany. During the 1-hour street survey, the students interviewed a total of 41 people successfully. A better insight into the practice and perspectives of the Germans was obtained.

In the street survey, each respondent was asked four questions. The first question is about the beer drinking habit of the Germans. Speaking of the German culture, one indispensable part of it is, undoubtedly, beer. The Oktoberfest, regarded as the world's most important beer festival, is a 16-day folk festival in Munich running from mid or late September to the first weekend in October. As in 2015, the festival attracted 5.9 million guests, involving locals and tourists, and consumed 7.3 liters of beer. With this special festival, students were curious about the beer drinking habit of average citizens. The results showed that more than 70% of the respondents had beer at least once a week, and among them around 20% had beer 5 times or more every week. Fig. 1 below shows the result of beer consumption of local people on a weekly basis.

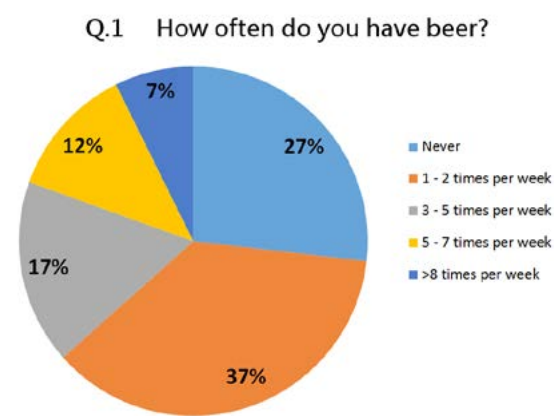


Fig. 1 Statistics on beer consumption of local people on a weekly basis

Although less clearly defined by geography than the other natural territories of western Europe (such as Italy, the Spanish peninsula, France or Britain), the area broadly identified as Germany has clear boundaries on three sides - the Baltic to the north, the Rhine to the west, the Alps or the Danube to the south. Since the region becomes associated with the name Germany in the 1st century BC until

the present time, a lot has happened to this place and therefore a lot has been left behind, including traditional culture, practice and heritage. The second question attempts to find out to what extent the German people think their government has done enough to preserve their tradition and heritage.

Q.2 Do you think the government has done enough to preserve the German tradition/heritage?

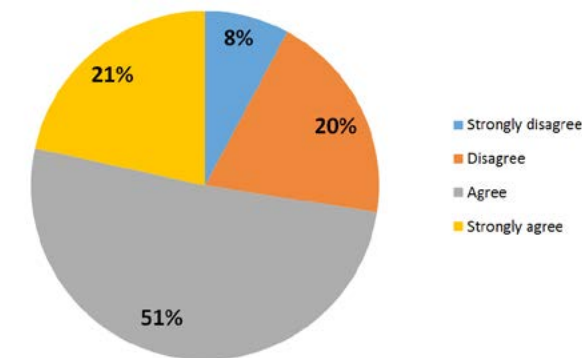


Fig. 2 Statistics on the rate of satisfaction with the preservation work by the German government

Fig. 2 above shows that over 70% of the German people agreed that their government has done enough on the preservation work. However, there are still 28% of people who believed that the government has to make more efforts in this respect.

Germany is now the largest country in Central Europe, the largest economy in the European Union and the fourth largest in the world. Due to her great strengths in many areas which claim international fame, students were interested to know how the local people see their own country — which aspects they feel proud of and areas which need improvement. Fig. 3 and Fig. 4 show the response to these two questions.

Q.3 As a German, which aspects are you most proud of?

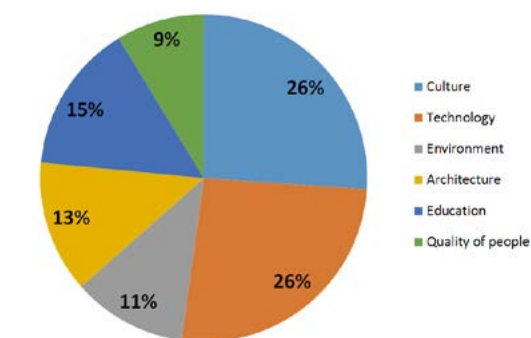


Fig. 3 Statistics on areas which the local people are proud of

Q.4 Which aspects do you think have room for improvement?

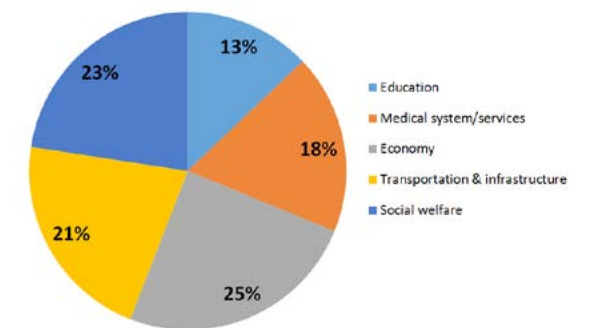


Fig. 4 Statistics on areas which need improvement

Referring to Fig. 3, culture, technology and education were the three main aspects which the respondents liked about their own country. Interestingly, culture and technology each was supported by a quarter of the respondents (26%). On the other hand, Fig. 4 shows that economy, social welfare, transportation and infrastructure were the three areas which the respondents found the most disagreeable. About 25% of the respondents found that the economy and transportation and infrastructure would need improvement.

History



Through exploring different artifacts, historical relics as well as historical sites, our horizon is being widened and it is a valuable chance for us to achieve life-wide learning.

A Touch of Ancient History

There are many ways to learn about history, including visiting historical sites, memorials and museums. Museums offer a dynamic opportunity to expose students to experiences and explore new things in a rich and educational environment. Through interactive exhibits and hands-on play, students have the ability to take ownership of their own learning and develop and explore their own curiosities. In this trip, we visited museums of different nature in three cities of Germany. The visit to Pergamon Museum and Neues Museum of The Museum Island provided an excellent opportunity for our students to learn the ancient history.

The Pergamon Museum

The museum is subdivided into the Antiquity Collection, the Museum of Islamic Art and the Middle East Museum.

Antiquity Collection

The collection contains sculpture from archaic to Hellenistic ages as well as artwork from Greek and Roman antiquity: architecture, sculptures, inscriptions, mosaics, bronzes, jewellery and pottery. The main exhibits are the Pergamon Altar from the 2nd century BC, with a 113 m long sculptural frieze depicting the struggle of the gods and the giants, and the Gate of Miletus from Roman antiquity.

The Pergamon Altar is a monumental construction built during the reign of Greek King Eumenes II in the first half of the 2nd century BC on one of the terraces of the acropolis of the ancient Greek city of Pergamon in Asia Minor. Pergamon was currently located 26 km from the Aegean Sea on a promontory on the north side of the river Caicus. Today, the main sites of ancient Pergamon are to the north and west of the modern city of Bergama in Turkey.

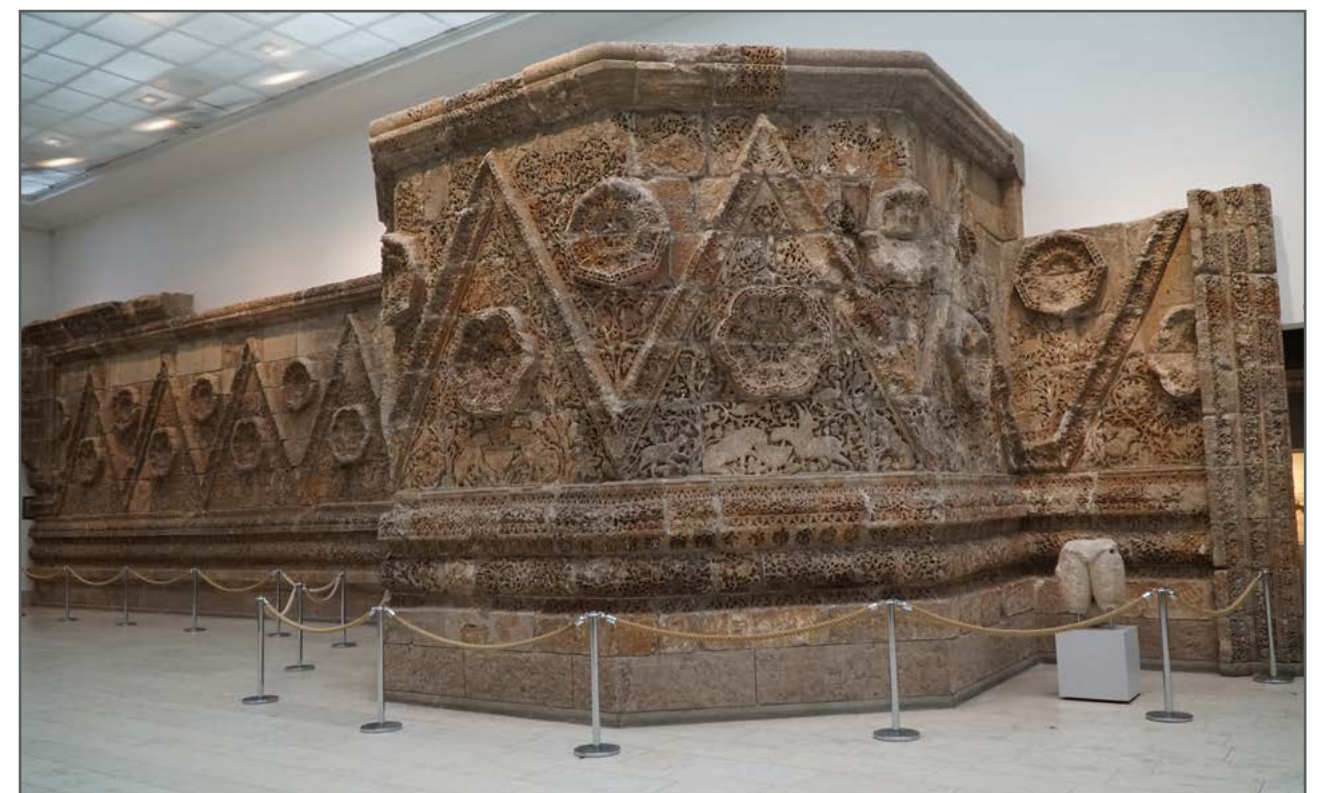
The Pergamon Altar



The Museum of Islamic art (Museum für Islamische Kunst)

Besides Islamic artwork from the 8th to the 19th century ranging from Spain to India, the main attraction is the Mshatta Facade, which originates from an unfinished early Islamic desert palace located south of Amman in present-day Jordan. It was a gift from the Ottoman Sultan Abdul Hamid II to Emperor Wilhelm II of Germany. Parts of the eastern portion of the facade and the ruins of the structure of which it formed a part remain in Jordan. It is now installed in the south wing of the Pergamon Museum. It extends across the 47-metre-long and 5-metre-high central section of the main facade and testifies to the artistic creativity of the Umayyad period.

Mshatta Facade - The Desert Palace



The Desert Palace of Mshatta is the key to the history of Islamic art.

The Aleppo Room

This area of the museum features a reception room of a prosperous broker's home in Aleppo, Syria, in the Ottoman Period. The paintings inside the Aleppo room make up the oldest collection from a Syrian dwelling house in the Ottoman Period.



The Middle East Museum

The exhibition in the Middle East Museum displays object found by German archaeologists and others from the areas of Assyrian, Sumerian and Babylonian culture. Additionally, there are historical buildings, reliefs and lesser cultural objects and jewellery. The main displays are the Ishtar Gate and the Procession Way of Babylon together with the throne room facade of Nebuchadnezzar II.

Ishtar Gate

The original Ishtar Gate was the eighth gate to the inner city of Babylon. It was constructed in about 575 BC by order of King Nebuchadnezzar II on the north side of the city.



The Procession Way of Babylon

In ancient Babylon, the Processional Way led to Ishtar Gate.



The Market Gate of Miletus

The Market Gate of Miletus is a large marble monument. It was built in Miletus in the 2nd century AD and destroyed in an earthquake in the 10th or 11th century. In the early 1900s, it was excavated, rebuilt, and placed on display in the Pergamon Museum. The history of the ancient town of Miletus in Asia Minor spanned from the Bronze Age to the Age of the Byzantine Empire. For centuries, it was one of the wealthiest towns in the Mediterranean, ruled first by Minoans, then by Mycenaean and Greeks and eventually by Romans. The Market Gate is the most significant piece remaining from the Roman Period. It replaced an existing Doric proylon and served as the northern entrance to the southern market, or agora, in Miletus, an ancient city in what is now Turkey.



The Code of Hammurabi

The Code of Hammurabi is a well-preserved Babylonian law code of ancient Mesopotamia, dating back to about 1754 BC (Middle Chronology). It is one of the oldest deciphered writings of significant length in the world. The sixth Babylonian king, Hammurabi, enacted the code, and partial copies exist on a seven and a half foot stone stele and various clay tablets.



Students showed interest in the relics, artefacts, sculptures, and carpets of ancient civilization.

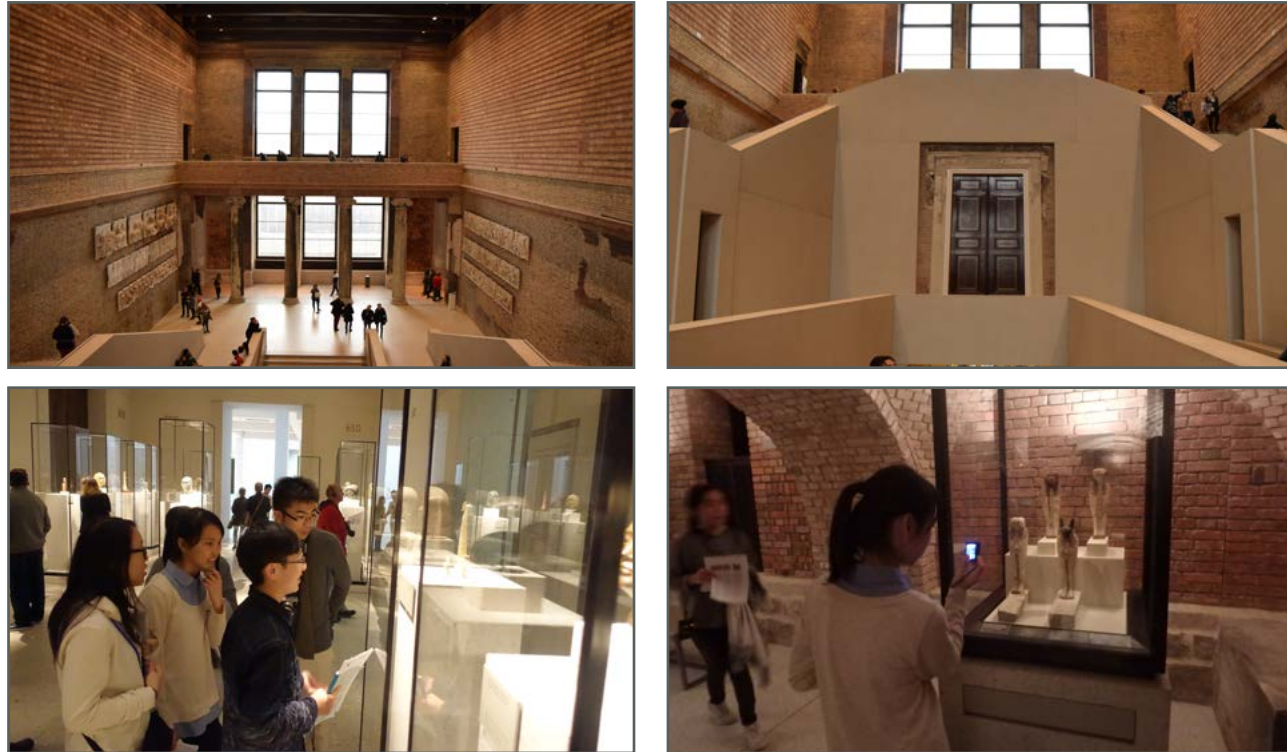
Model of the “Tower of Babel”

This model shows a possible reconstruction of the stepped tower of Babylon, which was dedicated to the city god Marduk. The model was made by Hans-Jorg Schmid in 1991. This building (in Akkadian called zikkurat) might be the historical background for the biblical story of the “Tower of Babel”. In Ancient Near Eastern thought, this stair-like structure connected heaven and earth, as the translation of the Sumerian name Etemenanki, “House, foundation of heaven and earth”.

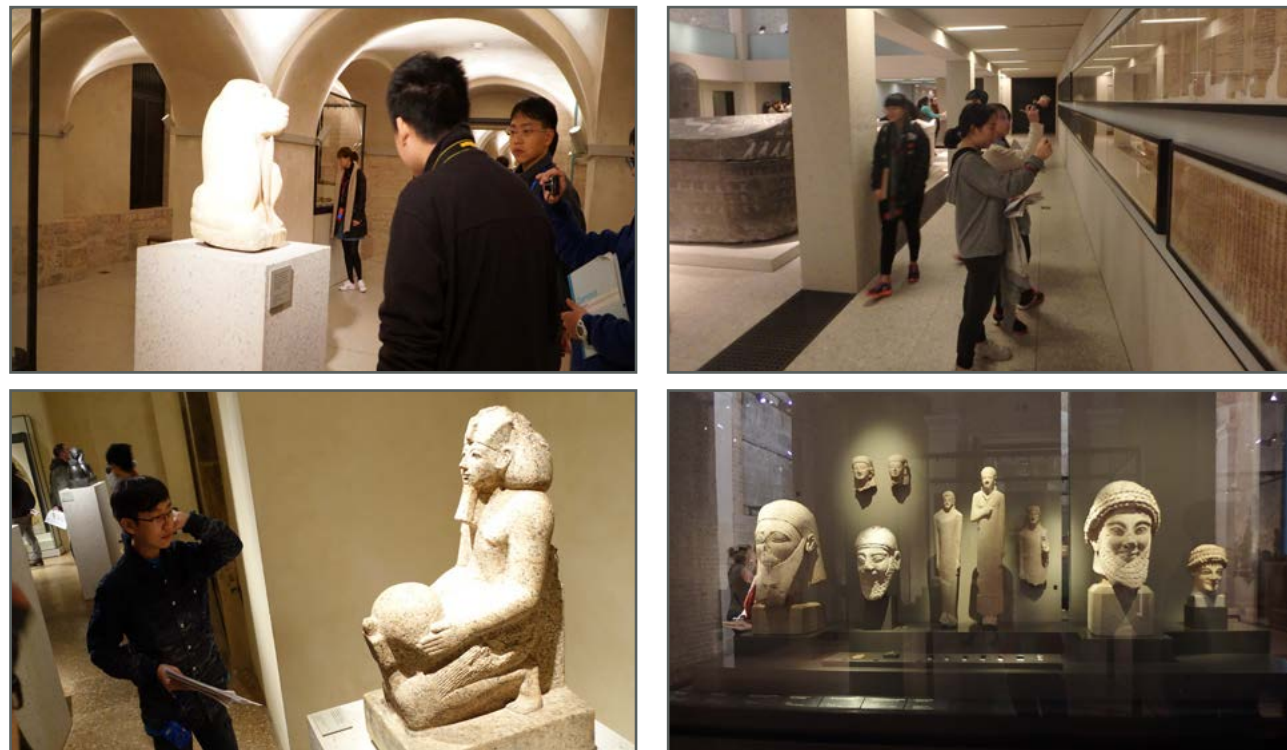


The Neues Museum

Exhibits of the Neues Museum include the Egyptian, prehistory and early history collections. The artefacts it houses include the iconic bust of the Egyptian queen Nefertiti. With all these relics, our understanding of the ancient civilization is enhanced.



Students are studying the antiques of the ancient Egyptian civilization. The exhibits include the Egyptian, prehistory and early history collection.



Tomb ensembles

In all periods of ancient Egyptian history the dead were laid to rest with grave goods which were intended to make their life more pleasant in the hereafter. These included food, vessels, implements, weapons, jewellery, statues of the deceased and usbabtis (“answerers”) who were to perform any duties which would be expected of the deceased in the afterworld. Mummification was the customary practice from the third Dynasty (2707-2639 BC) and was meant for full preservation of the body for three spirits, Ka, Ba and Akh. The internal organs were placed in four vessels (canopic jars) each assigned to one of four deities for safekeeping. The sarcophagi in shape of a box, prevalent in the early dynasties, were later superseded by the human-shaped coffins until the box form became popular again in Greek and Roman times. In Roman times wooden boards bearing the features of the deceased (mummy portraits) were placed on the mummies to serve the purpose of identification.



Displays of a mummy mask of a woman with bracelets in the form of snakes.

Beards are fashionable?

Beard trends change continuously throughout cultural history. It is often a case of temporary fads which are quickly replaced by others. However, special beard trends can sometimes shape entire epochs. In ancient Rome, the citizens followed the changing beard trends of their caesars. Similarly, the representative mutton chops or moustaches of many Hohenzollerns did not just provide recognition value, but were also considered to be trend-setters, even if they were not always practical, as demonstrated by a moustache cup. It was more important that they were able to wear an external sign of political affiliation and loyalty towards the monarch in the form of a beard. In contrast, artists and intellectuals in particular, such as Auguste Rodin and Karl Marx, grew unconventional beards to emphasise their independence.



Golden death mask (replica)

Head of a sphinx of Queen Hatshepsut

The so-called golden mask of Agamemnon, king of Mycenae, features a three-part full beard. Together with exclusive burial objects, it signifies his majesty as a ruler. However, in the late Mycenaean Period of Agamemnon (around 1200 BC), his upper lip was shaved so that the golden mask could be put into the grave of an earlier Mycenaean ruler. Even Egyptian queens, in this case Queen Hatshepsut, were depicted with the so-called royal beard, a typical symbol of power. In most cases, this was a braided, artificial goatee which was straight in shape and wider at the end. It was most likely worn to ceremonial events.



The first exhibition in Berlin about Beards



Gerhard Goder, Conchita Wurst on a crescent

The first exhibition in Berlin about Beards took place at the Neues Museum. The exhibition started in December 2015 and will end on 3 July 2016. Objects related to shaving and beards from all the different museums of Berlin have been gathered and displayed. The singer Thomas Neuwirth entered the stage in women's clothes as the fictional character Conchita Wurst with a beard, thereby challenging existing gender norms. Conchita's victory at the Eurovision Song Contest in 2014 was an expression of tolerance for diverse ways of life.

The Age of the Pyramids (2707-2216 BC)

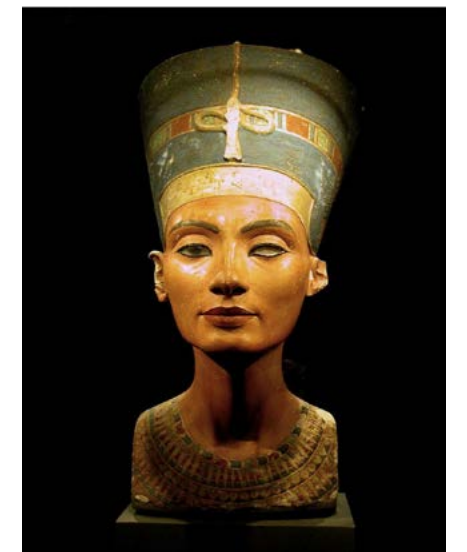
The Age of Pyramids was marked by the undisputed role of the pharaoh. The entire administrative and economic organization was subordinate to his central authority. As a result of the uniform steering and control of their society, the rural communities were connected to the latter, to the temples, and particularly to the palace. Communal work was reinforced and concentrated on the erection of increasingly monumental royal burial sites, together with the associated mortuary cult, from the 3rd dynasty (2707-2639 BC). A multi-tiered bureaucracy is introduced in order to master the pending task. The cult of the sun god Ra gradually moves into the foreground from the middle of the 4th dynasty (2639-2504 BC). This development finds its climax in the erection of sun temples during the 5th dynasty (2504-2347 BC). Central power dissolves with the end of the 6th dynasty (2347-2216 BC), leading to the so-called First Intermediate Period (2170-2020 BC) which is marked by the presence of numerous autonomous administrative areas.



The model of the Great Pyramid of Giza, which is the oldest of the Seven Wonders of the Ancient World.

Egyptian Queen Nefertiti

A German archaeological team led by Ludwig Borchardt discovered the Nefertiti bust in 1912. It has been kept in various locations in Germany since its discovery, including the cellar of a bank, a salt mine in Merkers-Kieselbach, the Dahlem museum, the Egyptian Museum in Charlottenburg and the Altes Museum. It is currently on display at the Neues Museum in Berlin and was originally displayed before the Second World War.



76 years later, Reflections on World War II

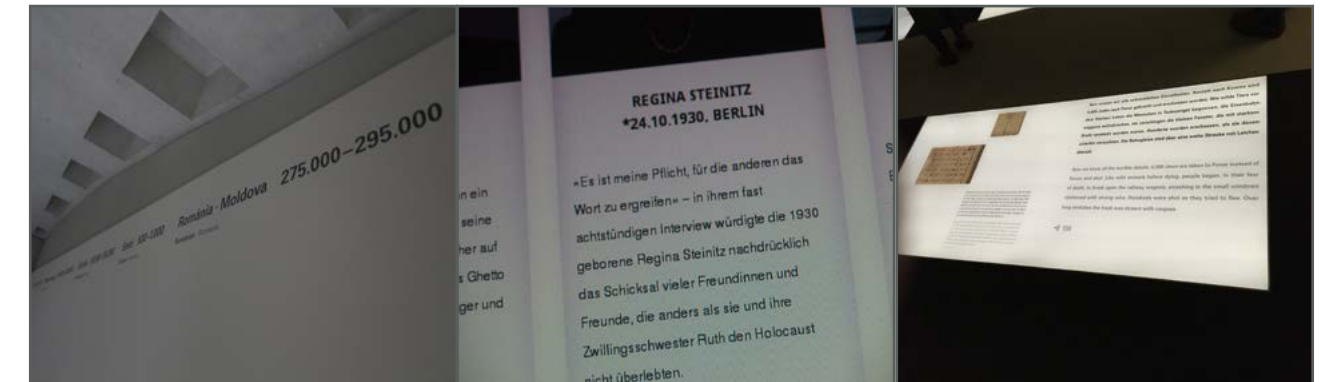
Dachau concentration camp, as well as the Holocaust Memorial in Berlin, certainly prompt reflection. One can glimpse the extent of the ruthlessness and brutality of the Schutzstaffel. It is hard to imagine that there was an electrified barbed-wire fence, a ditch, and a wall with seven guard towers surrounding the camp. Not surprisingly, however, is that during the 1930s, German physicians performed medical experiments on prisoners including high-altitude experiments using a decompression chamber, malaria and tuberculosis experiments, hypothermia experiments, and experiments testing new medications. The prisoners were also forced to test methods of making seawater potable and of halting excessive bleeding. Hundreds of prisoners died or were permanently disabled as a result of these experiments. A sense of deep sorrow and empathy was felt especially when we visited the Dachau memorial hall as well as the Holocaust Memorial in Berlin. Pictures, photos, letters, posters and all the historical relics deepen one's understanding and sympathy for the Jews. Their experiences moved nearly everyone to tears.

The Holocaust Memorial in Berlin

The Memorial to the Murdered Jews of Europe in the centre of Berlin is the Holocaust Memorial for Germany. The exhibition is about the persecution and extermination of the European Jews and the historical importance. The construction of this memorial began on 1 April 2003 and was inaugurated on 10 May 2005. It is a part of the celebration of the 60th anniversary of Victory of European Day. The Holocaust memorial is regarded as a success and is called a "tourist magnet". The memorial consists of a Field of Stelae covering an area of 19,000 m². It contains 2711 concrete blocks plus an information centre.



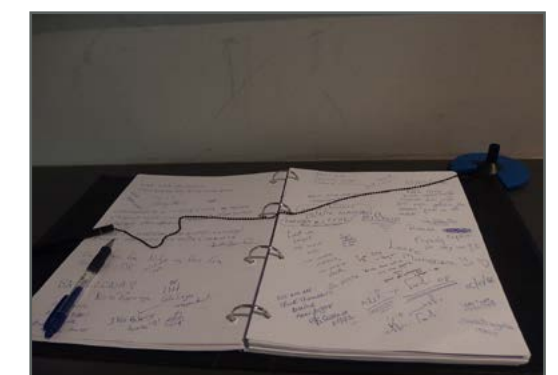
The room shows diary entries, letters and last notes that were written during the Holocaust. The personal level is enhanced by the circumferential row providing the number of victims for the European countries concerned.



The exhibition starts with an overview of the national-socialist terror policy between 1933 and 1945. A timeline of images and texts deal with the persecution and murder of European Jews.



Students listen to the voices of survivors. Ten computer terminals showcasing interviews with Holocaust survivors in ten languages are provided.



Students study the database of the Holocaust victims at the Israeli Yad Vashem commemoration site with over three million entries. (left photo) Visitors wrote condolence messages to commemorate the death of the Jews. (right photo)

Dachau Concentration Camp and Memorial Sites

Dachau initially housed political prisoners. It eventually evolved into a death camp where hundreds of thousands of Jews died from malnutrition, disease and execution. With the advent of World War II, some able-bodied Dachau prisoners were used as slave labour to manufacture weapons. Some of them were subjected to brutal medical experiments by the Nazis. Finally, U.S. military forces liberated Dachau in late April 1945. The tour of Dachau Memorial site begins at the original gate, which was completed in June 1936. Arbeit Macht Frei means, "Work makes Freedom". This sign was intended as a cruel insult to the prisoners who had to work with no hope of freedom because the official Nazi policy was "extermination through work".



The entrance of the Dachau Memorial Site



In the camp, guard towers and electric wire were used to prevent prisoner escape from the concentration camp. The following pictures show the Dachau at the time and nowadays. Ditches and fences were also used to prevent prisoners from escaping from the Camp. Many prisoners tried to escape but died due to the electric wire.



These pictures shows the location of the former barracks in the concentration camp.



On the way to the gas chamber, there is a Jewish Memorial church.



Jewish Memorial church



We visited the cruellest parts of the concentration camp: the crematoriums and gas chamber.



The gas chamber building



The interior of the gas chamber



The word "brausebad" is the German word for gas chamber. On the blueprints for Baracke X, the gas chamber was called a shower room, but each of the four disinfection chambers was called a "gaskammer".



Ovens in the crematorium

The most prominent spot is Catholic Church of the Mortal Agony of Christ and the bell tower with a cross on top. The bell rings at 2:50 p.m. everyday to commemorate the exact time that the Dachau camp was surrendered to the 42nd Rainbow Division of the U.S. Seventh Army.



The Jewish Memorial, designed by Frankfurt architect Hermann Zwi Guttmann, is located approximately 40 yards east of the Catholic Memorial in the area of the former Dachau concentration camp. A small Russian Orthodox Chapel, named "Resurrection of our Lord", is located just to the left of the tourist entrance into the crematoria area at the Dachau Memorial Site. It was built by members of the Russian armed forces and was dedicated on 29 April 1995, the 50th anniversary of the liberation of the Dachau concentration camp by American troops.



Jewish Memorial



Russian Orthodox Chapel



Rows of poplar trees are grown along the paths of the concentration camp.

The Dachau Museum

The exhibition is divided into six sections and presented in 13 rooms or segments. Sections 1 and 2 explain the Nazi camp system and the historical background to the Nazi dictatorship.



Students visit the Dachau Museum, which exhibits replaced photos and artefacts in honour of prisoners from different countries that were sent to Dachau.

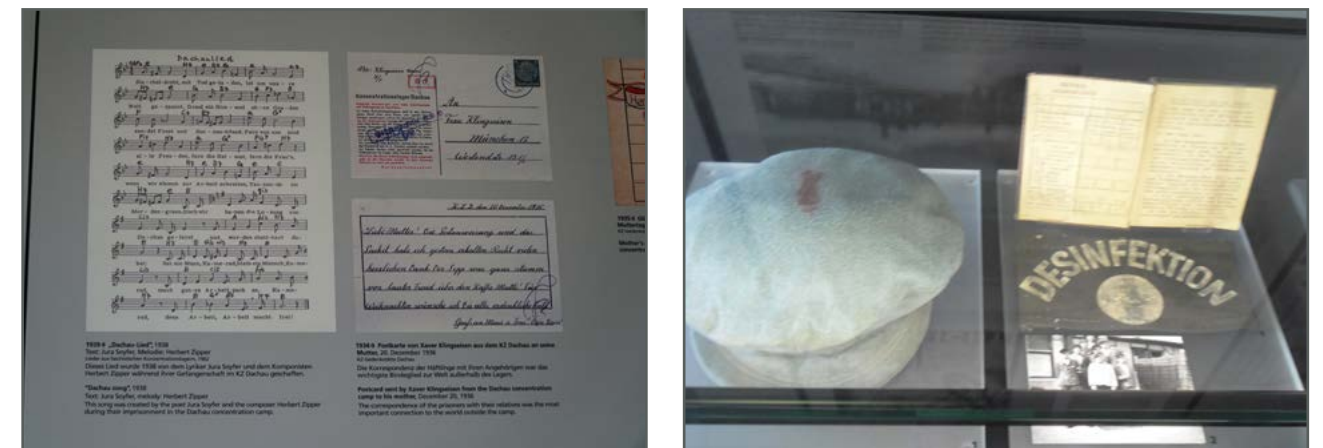
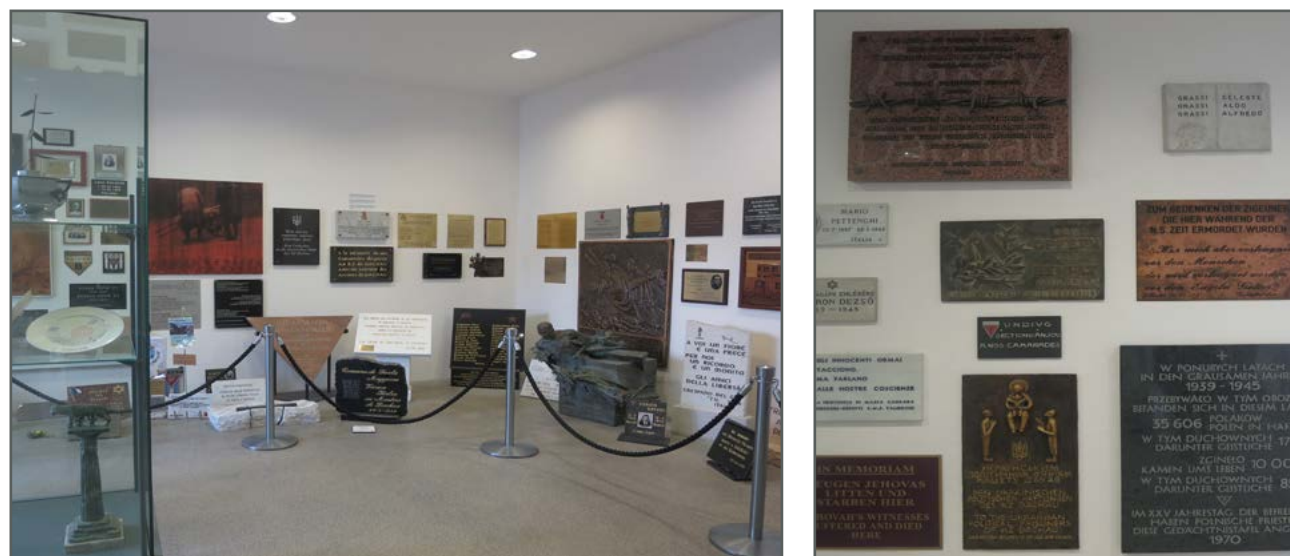
The first phase spans the years 1933 to 1939 when the concentration camp was used as an instrument of terror to eliminate political opposition.



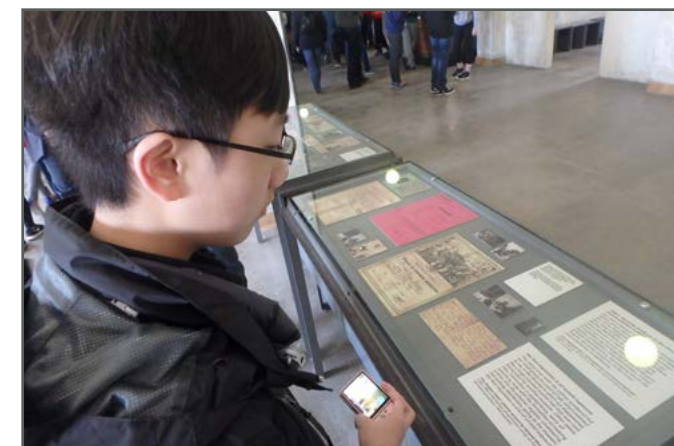
The second phase corresponds to the years of German military success in the war, from 1939 to 1941 as the concentration camp was turned into a tool of war policy.



The third phase covers the years from 1942 to 1945 and is entitled "Prisoners in the Armaments Industry".



The original Dachau Song is displayed in the museum.



A student studies the relics and letters written by the Jews.



A model of the layout of the concentration camp

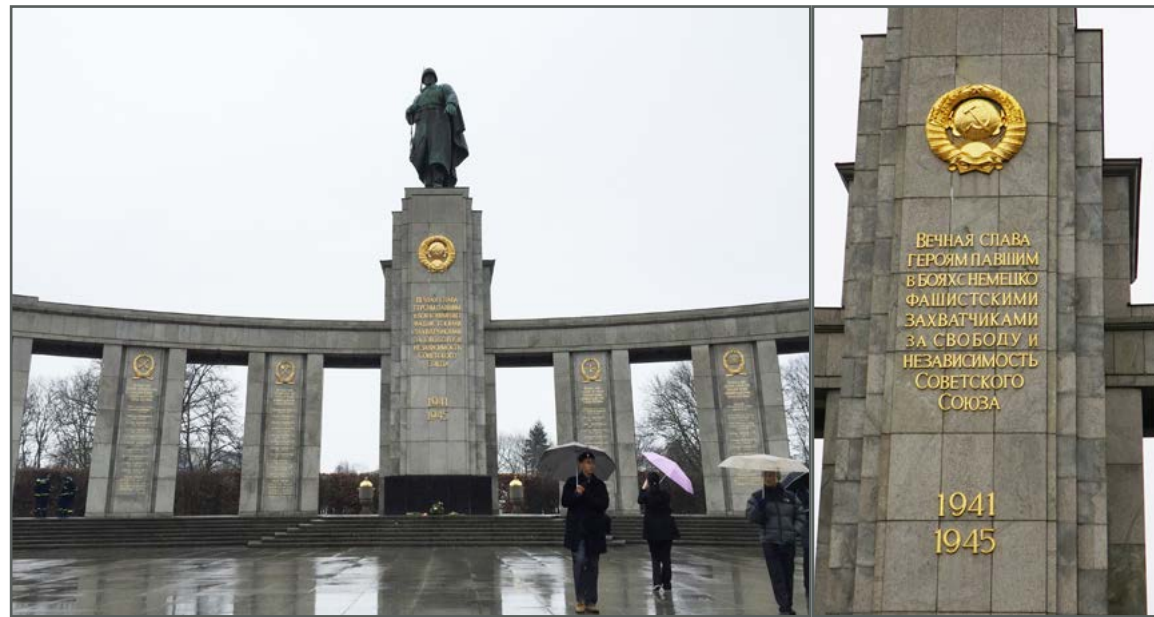
After liberation, inscriptions in different languages were made on a memorial to those who died at the camp. The inscription is in several languages and reads, "May the example of those who were exterminated here between 1933 and 1945 because of their fight against National Socialism unite the living in their defence of peace and freedom and in reverence of human dignity."



The Soviet War Memorial (Tiergarten)

The Tiergarten was erected by the Soviet Union to commemorate the 80,000 soldiers of the Soviet Armed Forces who died during the Battle of Berlin. The Tiergarten was destroyed by bombs. Today, it is surrounded by extensive woodland. Although this memorial stood in the British sector of Berlin, its construction was supported by all the Allied Powers. During the Cold War, Soviet honour guards from the Soviet sector were sent to stand watch at the memorial.

The picture shows the Russian inscription of the Soviet victory on the central column of the memorial.



The photo shows the front of the Soviet War Memorial in Tiergarten. The memorial is still a site of active commemoration. It is also a popular tourist attraction.



The boards show the history of the war memorial in Tiergarten. (left and middle photos)
Our tour guide tells us the legend that the stonework for this memorial was taken from the destroyed Reich Chancellery (right photo)

Hofbrauhaus Munich Beer Hall

In 1920, Hitler held his first mass meeting. He met strong opposition from leading party members who thought it was premature and feared it might be disrupted by Marxists. The Beer Hall Putsch, also known as the Munich Putsch, was a failed coup attempt to seize power in Munich from the 8th to the 9th of November 1923. About two thousand men marched to the centre of Munich and confronted the police, resulting in the death of 16 Nazis and 4 policemen. Hitler himself was wounded during the clash. After two days, Hitler was arrested and charged with treason.



The Hofbräuhaus in München is a brewery in Munich, owned by the Bavarian state government. It is one of Munich's oldest beer halls. The Hofbräuhaus in München is famous since it is used to be the secret meeting place of Hitler and the Nazi party.



History of Modern Germany

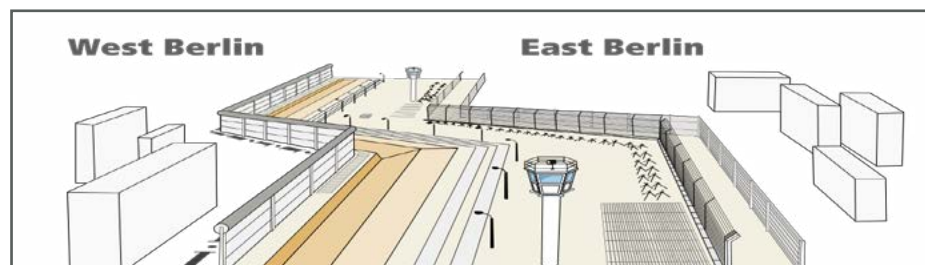
In 1871, following the Franco-Prussian War, Germany was transformed into an empire under Emperor William I, and the King of Prussia German Empire was established. Germany then joined the other great powers in colonial expansion in Asia and Africa as the Industrial Revolution modernized the German economy. The Bismarck Memorial explored this history.

In 1933, the Nazis under Adolf Hitler came to power and a totalitarian regime was established. Hitler carried out a series of repressive policies and aggressive expansionist policies. During his reign, the most troubling policies were those that created the Holocaust. Hitler believed that Germany was “stabbed in the back” by the Jews and that they caused Germany’s defeat in the First World War. He also believed that Jews were an inferior race. Hence, he adopted anti-Jewish policies to drive them out. All in all, over six million Jews were killed. In this trip, we visited the Hofbrahaus Munich Beer Hall, a landmark in Munich which highlighted this history.

In the aftermath of Second World War and the occupation by the victorious powers (the United States, the Soviet Union, Britain, and France), Germany became two states. The construction of the Berlin Wall marked a new page in the Cold War. In 1990 German unification overcame the geographic separation of the two German states, including the infamous wall between West Berlin and East Berlin, but economic integration was still not achieved satisfactorily. In the first decade of the 21st century, the forces of globalization pose a renewed challenge to the social-market economy in place throughout the nation. However, Germany is one of the most prosperous countries in Europe and their political and economic status is indispensable.

Berlin Wall

The Berlin Wall was a physical barrier that divided Berlin from 1961 to 1989. It was erected by the GDR on 13 August, 1961. The official purpose of building this Berlin Wall was to keep Western “Fascists” from entering East Germany and undermining the socialist state. In November 1989, the Cold War began to thaw across Eastern Europe. After a period of civil unrest, East Germany announced on 9 November 1989 that all GDR citizens could visit West Germany. Most of the wall was demolished in late 1990s. The fall of the Berlin Wall indeed paved the way for German reunification. To the rest of the world, the Berlin wall is also a symbol of repression. Nowadays, the Berlin Wall remains as one of the most powerful and enduring symbols of the Cold War.



Structure of the Berlin Wall

For 28 years, the 28 mile Berlin Wall split a city in two and divided a nation by two million tons of concrete, tank traps, death strips and tripwires.



Students attempt to climb over the Berlin wall. The wall was made of a 12-foot-tall, 4-foot-wide mass of reinforced concrete which makes climbing nearly impossible.



“Brother Kiss”

“Brother Kiss” is a famous painting on the East side Gallery of the Berlin Wall which depicts East German President Erich Honecker welcoming Soviet Leader Leonid Brezhnev. It was customary for Socialist leaders and party members to greet each other with a bear hug and a kiss. The intimacy of the moment was captured initially on black and white film. A Graffiti painting from 1990 on the Berlin Wall called “My God, Help Me to Survive This Deadly Love” is shown.

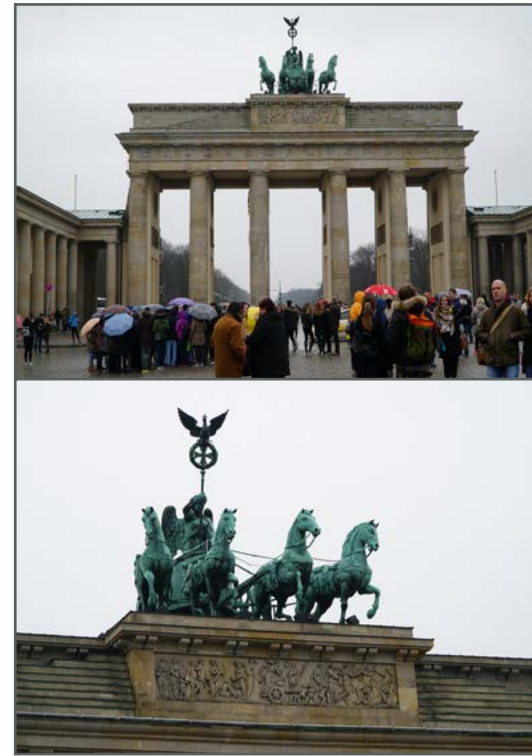


The Brandenburg Gate

The Brandenburg Gate is an 18th century neoclassical triumphal arch in Berlin. The monumental gate was commissioned by the Emperor William II as the replacement of an older gate. It is located in the western part of the city centre of Berlin, linking the junction of Unter den Linden and Ebertstraße. During the Cold War, the gate was located near the border between East and West Berlin; it became a symbol of a divided city. When the Berlin Wall fell in 1989, the Brandenburg Gate became a symbol of a reunified Berlin. The bronze Quadriga of victory crowning the gate was created in 1793 by Johann Gottfried Schadow and the four horse triumphal chariot is driven by the winged goddess of peace.

The Brandenburg Gate is 26 m high, 65.5 m wide and 11m thick. It consists of 12 Doric columns, six on each side creating five portals.

Embassies of other countries are mainly located next to the Brandenburg gate, which is considered as a symbol of the tumultuous history of Europe and also European unity and peace.



A group photo taken in front of the Brandenburg Gate which is a symbol of peace and Berlin's most famous landmark



The Berlin Victory Column

The Victory Column which was designed by Heinrich Strack, is a monument in Berlin. It was built in 1864 to commemorate the Prussian victory in the Danish-Prussian War. Prussia defeated Austria in the Austro-Prussian War (1866) and France in the Franco-Prussian War (1870–71), giving the statue a new purpose.



The picture shows the Statue of Victoria, a bronze sculpture of Victoria, 8.3 m high and weighing 35 tonnes, designed by Friedrich Drake. Berliners call the statue the nickname Goldelse, meaning something like “Golden Lizzy”.

The Bismarck Memorial

The Bismarck Memorial is a prominent statue dedicated to Otto Von Bismarck, Minister President of the Kingdom of Prussia and the first Chancellor of the German Empire. The statue, along with the famous Berlin victory column, marked with shrapnel damage during Second World War, has maintained largely intact nowadays. The memorial in Berlin portrays Bismarck in his ceremonial garb as Chancellor standing above the status of Atlas, Siegfried, Germania and Sibyl.



The statue shows Von Roon, who was a Prussian soldier and statesman. As Minister of War from 1859 to 1873, Roon won the unification wars.

Science and Technology



“Made in Germany” is a label of quality. We recognized the development of science and technology through our visit to the Audi plant, numerous museums and our observation in the trip.

The Potsdam-Telegrafenberg Historical Site



The campus of Telegrafenberg in Potsdam is the cradle of modern scientific geodesy.

The Potsdam-Telegrafenberg Historical Site is located on the Telegrafenberg, Potsdam, about 45 min traveling distance from Berlin. Its name was derived from an optical telegraph that was built in 1832 on the top of the hill as part of the Prussian semaphore system which encompassed 62 stations between Berlin and Koblen. The optical telegraph line was discontinued with the introduction of the electric telegraph line in 1852.

The Telegrafenberg hill has the Science Park Albert Einstein named in 1992 and hosts a conglomerate of major scientific institutions. The Helmholtz Centre Potsdam GFZ German Research Centre for Geosciences (GFZ), the Potsdam Institute for Climate Impact Research (PIK), a branch of the Alfred-Wegener Institute, Leibniz Institute for Astrophysics Potsdam (AIP) with its solar observatory Einstein Tower and the Great Refractor are located on the site.¹

The buildings on the Telegrafenberg were constructed during the period of 1874 to 1899. In 1876, the first building of the park, the main building of the Astrophysical Observatory Potsdam (AOP), was completed. In 1899, the Great Refractor was built. With the operation of the Einstein Tower from 1924 onward, the era of modern solar research in Potsdam and Germany began. After more than 80 years in use, the Einstein Tower remains the largest solar telescope in Germany and solar physics remains a research focus of the AIP.^{2,3}

¹ Ossing, A Scientific Stroll across the Telegrafenberg Potsdam. Available: http://gfzpublic.gfz-potsdam.de/pubman/item/escidoc:56137/component/escidoc:1285135/Bergbroschuere_web_engl.pdf [last accessed 24 June 2016]

² Leibniz-Institut für Astrophysik Potsdam. The Potsdam-Telegrafenberg Historical Site. Available: <http://www.aip.de/en/institute/locations/the-potsdam-telegrafenberg-historical-site> [last accessed 24 June 2016]

³ Astronomische Gesellschaft - Herbsttagung. Available: <http://www.aip.de/AG2009/wherewhen.html> [last accessed 24 June 2016]

Potsdam Institute for Climate Impact Research (PIK)



The historical astrophysical observatory, Michelson-Haus, is the main building of PIK.

PIK is a German government-funded research institute which addresses crucial scientific questions in the fields of global change, climate impact and sustainable development. Ranked among the top environmental think-tanks worldwide, it is one of the leading research institutions and part of a global network of scientific and academic institutions working on questions of global environmental change.⁴

The Helmholtz Centre Potsdam GFZ German Research Centre for Geosciences (GFZ)

GFZ is the national research centre for Earth Sciences in Germany. It hosts and facilitates large scale research in geoscience, ranging from earth observing satellite missions to physics and chemistry of the earth to geoengineering. They work in close interdisciplinary collaboration with the related scientific disciplines: physics, mathematics, chemistry and biology as well as with the engineering science disciplines of rock mechanics, engineering hydrology and seismology. Similar to most German institutes, GFZ is also keen to popularize science and technology amongst young people. Our hosts, Dr. Wille and Dr. Lavin-Zimmer, delivered talks on the topic of history and research of GFZ. They were kind enough to show us around the Science Park as well. During our visit, we were fortunate to visit the well-preserved The Great Refractor of Potsdam, the historic site of the optical telegraph, Einstein Tower and conducted the subduction simulation workshop designed for young visitors.



Dr. Wille, Dr. Lavin-Zimmer and Miss Zimmer are introducing the history and research of GFZ.



Our Principal Mr. Au presents souvenirs to the hosts and concludes the visit with a group photo.

⁴ Leibniz-Institut für Astrophysik Potsdam. Förderverein Großer Refraktor Potsdam e.V. Available: http://www.aip.de/grosser_refraktor/ [last accessed 18 June 2016]

The Great Refractor of Potsdam

Astrophysical Observatory of AIP hosts the world's fourth largest refracting telescope, Potsdam Große Refraktor, which was completed in 1899. The mechanical part of the telescope and the buildings were damaged in 1945 during Second World War. The repair and modernization of the telescope were made from 1953 to 1968.



The photos show the entrance and front view of the building for the Great Refractor of Potsdam.⁵

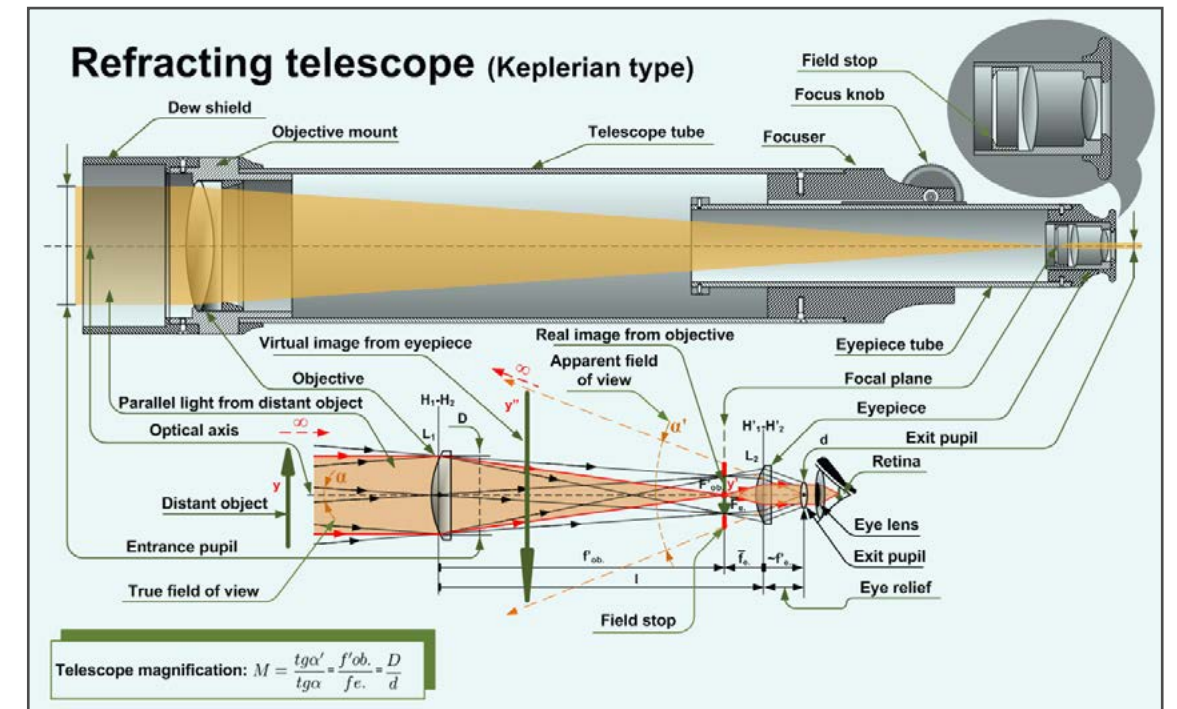


Students observe with great interest (Top-right) the double telescope of the Great Refractor (Left) and listen carefully to the explanation of Dr. Gußmann (Bottom-right).

The Great Refractor of Potsdam, a double telescope of 1899 with 80 cm (focal length of 12.14 m) and 50 cm (focal length of 12.59 m) objective lenses, was one of the world's largest telescopes at the time of construction. The rotatable dome weighs 200 tones and is 21 feet in diameter.⁶



Dr. Gußmann of AIP is introducing the history and structure of Great Refractor



Working principle of refracting telescopes

A refracting telescope consists of two lenses: objective and eyepiece, which are used to focus light rays for a brighter, clearer and magnified virtual image. The objective refracts light from a distant object subtending a visual angle α to its focus. The eyepiece then produces the final image with a visual angle α' . The ratio α' -to- α is the angular magnification of the telescope. Refracting telescopes can come in many different configurations to correct for image orientation and types of aberration. Because the image is formed by the bending of light (refraction), these telescopes are called refracting telescopes or refractors.⁷

⁵ Leibniz-Institut für Astrophysik Potsdam, Förderverein Großer Refraktor Potsdam e.V. Available: http://www.aip.de/grosser_refraktor/ [last accessed 18 June 2016]

⁶ Wikipedia. Great refractor. Available: https://en.wikipedia.org/wiki/Great_refractor [last accessed 18 June 2016]

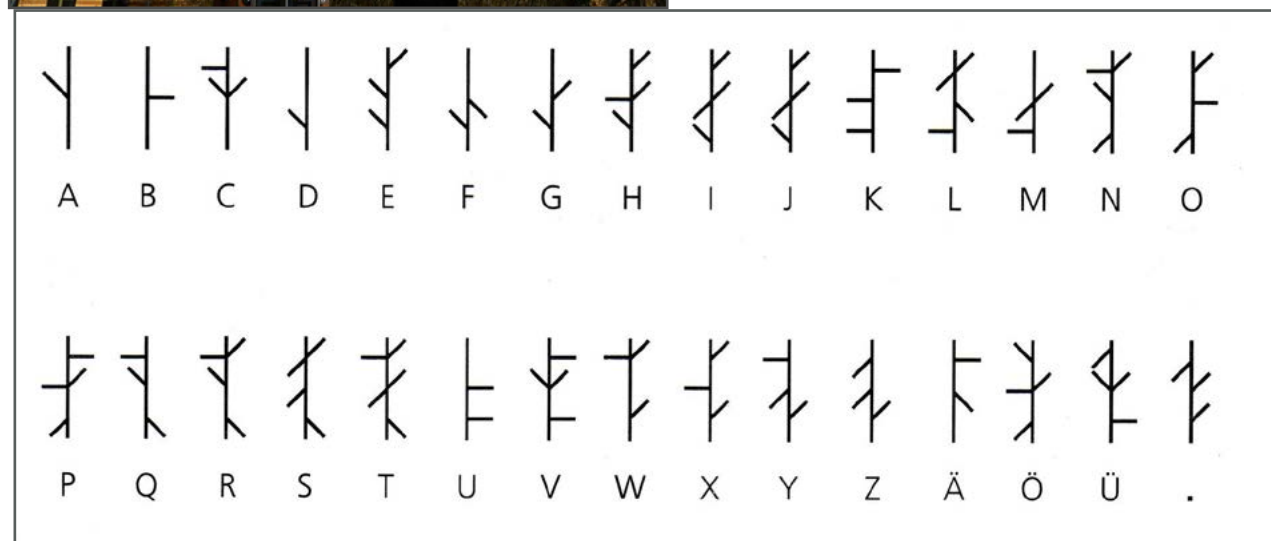
⁷ Wikipedia. Refracting telescope. Available: https://en.wikipedia.org/wiki/Refracting_telescope [last accessed 18 June 2016]

Optical Telegraph in GFZ



Working Principle of Optical Telegraphs

Optical telegraphs were operated with six adjustable levers arranged above each other in pairs on a vertical mast. The position of each lever corresponded to the three-level alignment of the signal arms on the mast. The levers and signal arms were connected by hemp ropes and later by wire cables. Each lever was lockable in four different positions that exactly corresponded to the position of signal arm: 0° (arm hanging downward parallel to the mast), 45°, 90° (perpendicular to the mast), and 135°. The diagram below shows the relationship of telegraph-alphabet with German "Umlaute".



The optical Telegraph replica (Top) is a semaphore communication system to transmit through German "Umlaute" (Bottom).⁸

Route of Optical Telegraph in Germany

The optical telegraph line in Germany began with Station #1 at the old Berlin Observatory in Dorotheenstrasse. The construction of the first section, with fourteen stations, was completed by November 1832. The route ran via the Telegraphenberg #4 in Potsdam across Brandenburg an der Havel to Magdeburg. The second and longer section between Magdeburg and Koblenz ran north of Egel (Schloss Ampfurth), through Halberstadt, Goslar, Höxter to station #31 near Entrup where it turned in a southwesterly direction before reaching Paderborn after crossing the Weser Uplands. Subsequently, it ran along the southern side of a line connecting Salzkotten, Erwitte, Soest, Werl, Iserlohn, Hagen, Schwelmand Lennep, Schlebusch, Flittard to Cologne in France. From there the route ran parallel to the east bank of the Rhine via Spich to Ehrenbreitstein. The final station (#60) was built into the Fortress Ehrenbreitstein. After the completion of construction and the start of operation of the whole system in 1833, it quickly became clear that the Rhine ferry crossing to Koblenz presented a major hold up in telegraphic traffic. This could only be solved by expanding the line with an end station in Koblenz. In the same year, station #61 was put into service in the Electoral Palace in Koblenz, which was then used as a barrack. The palace also served as the administrative office for the western section of the route. In 1842, station #24a near Mechtshausen was built to shorten the separation between stations #24 and #25 and solve the problem of visual interruption in unfavorable weather conditions. The entire route then comprised 62 stations. They were on average 11 km apart with the longest distance separating stations at 15 km and the shortest at 7.5 km.⁹



The map shows the full route of the historical telegraph line across Germany⁹

⁸ Wikiwand. Prussian semaphore system. Available: http://www.wikiwand.com/en/Prussian_semaphore_system [last accessed 20 June 2016]

⁹ Wikiwand. Prussian semaphore system. Available: http://www.wikiwand.com/en/Prussian_semaphore_system [last accessed 20 June 2016]

Einstein Tower

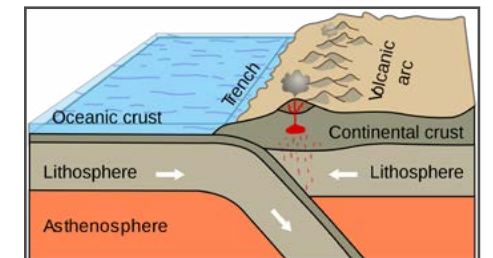


Group photo in front of Einstein Tower (German: Einsteinturm), one of the buildings of Leibniz Institute for Astrophysics Potsdam (AIP). The Tower is an astrophysical observatory in the Albert Einstein Science Park and was built by Erich Mendelsohn. It was built on the summit of the Potsdam Telegraphenberg in order to house a solar telescope designed by the astronomer Eriwn Finlay-Freundlich.

Subduction simulation workshop

Special thanks go to staff of GFZ for their reception and the workshop organized for CFSS students. Dr. Wille and Dr. Lavin-Zimmer firstly introduced us to the history, research and school programmes offered by GFZ, and then followed by a subduction simulation workshop. This workshop aimed at facilitating students' understanding of subduction. Sand in different colours represents different layers of soil (basalt, sand and limestone). The relative movement of continental plate and an oceanic plate can be rationalized from the movement of different layers of sand.

Subduction is a geological process that takes place at convergent boundaries (subduction zone) of tectonic plates where one plate moves under another and is forced down into the mantle. Rates of subduction are in centimetres per year, with the average rate of convergence being 2 to 8 cm per year. Stable subduction zones involve the oceanic plate sliding beneath another continental or oceanic plate due to the higher density of the oceanic plate. Subduction zones are sites that have a high rate of volcanism, earthquakes and mountain building, which are caused by the interactions between two plates.^{10,11}



Dr. Lavin-Zimmer explains the apparatus used to perform the simulation (Top-left). A group of boys perform the experiment with great enthusiasm (Top-right), while another group of girls listen carefully the instruction of Dr. Wille (Bottom).

¹⁰ Wikipedia. Subduction. Available: <https://en.wikipedia.org/wiki/Subduction> [last accessed 22 June 2016]

¹¹ Wikipedia. Geology of the Rocky Mountains. Available: <https://en.wikipedia.org/wiki/Subduction> [last accessed 22 June 2016]

German Technology Museum

History of Locomotion in Germany

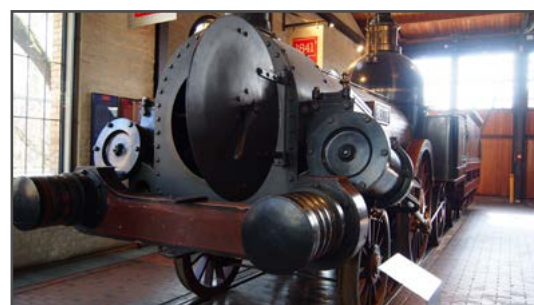
German Railway history began with the opening of the steam-hauled Bavarian Ludwig railway between Nuremberg and Fürth in 1835 and the completion of the first long distance railway, Leipzig-Dresden railway, in 1839. By the end of 1855, there were already more than 8000 km of railroads built in Germany. In 1871, German unification stimulated consolidation, nationalization into state-owned companies and further rapid growth. By 1880, Germany had 94,000 locomotives servicing 43,000 passengers.¹² During the Second World War, under Nazi Germany, two types of locomotives, *Kriegslokomotiven* and *Übergangskriegslokomotiven* were produced in larger numbers. Their construction was tailored to the economic situation of wartime, providing an efficient transportation of goods in support of military logistics.¹³



While German locomotives were popular for “long-distant” travellers, bicycles were prevalent for local commuters. The first recorded print reference of penny-farthing, a bicycle shown above, was in *Bicycling News* 1891.



This locomotive was built in Austria. Its exterior bar frames are nearly 3 inches thick. It remained in service near Graz in Austria until 1960.



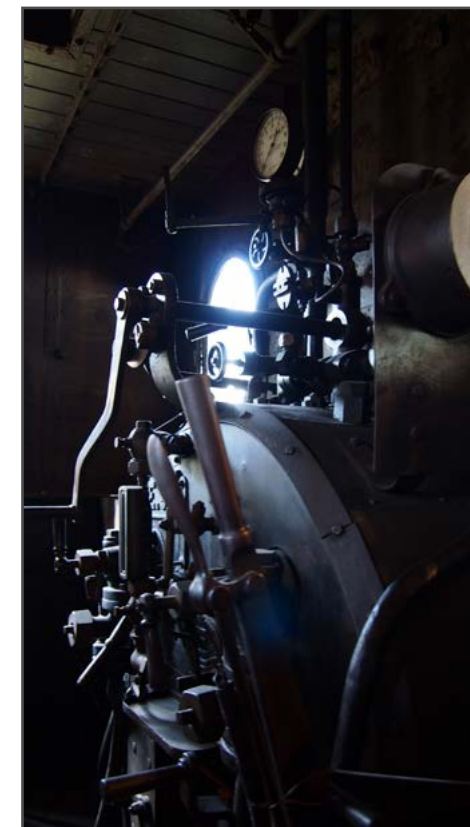
Beuth, an express locomotive, was built in 1842 and retired in 1864. It could reach a maximum speed of 42 km/h.



This is a model of a railway carriage that was used to transport Jews in the time of Nazi Germany.



Kriegslokomotiven was built during Second World War.



The internal design of engine shows the sophistication of the locomotive.



Teachers and students examine the differences between the design of first class and economy class of a railway carriage.



Underside of the locomotive

¹² Wikipedia. History of rail transport in Germany. Available: https://en.wikipedia.org/wiki/History_of_rail_transport_in_Germany [last accessed 22 June 2016]

¹³ Wikipedia. *Kriegslokomotive*. Available: <https://en.wikipedia.org/wiki/Kriegslokomotive> [last accessed 21 June 2016]

History of Aviation in Germany

There are numerous German aviation pioneers who helped establish the foundations of aviation. One of the greatest German aviation pioneers was Otto Lilienthal, who developed a number of hung glider designs in late 1800s. Within the period from 1891 to 1896, he created over 2,000 gliders with many different designs, including flapping wing models (ornithopters). Using a triangular control frame, Lilienthal was able to control his centre of gravity with his body, allowing him to fly easily from the tops of hills to the ground at roughly 10 meters per second. He was able to show that stable aircraft design was possible and even made advancements that eventually led to the biplane.¹⁴



First glider designed in 1891 by Otto Lilienthal, a German pioneer of aviation



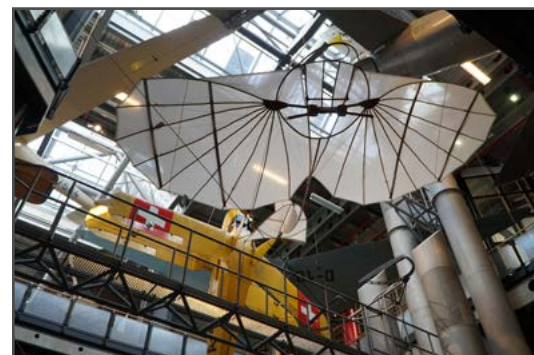
One of the five surviving Lilienthal gliders, designed in 1894

How gliders work?

A glider generates lift to oppose its weight as it flies through the air. According to Bernoulli's Principle, the lift is the result of the air pressure difference between the two sides of the wings that are kept at certain inclination and speed. To generate and maintain the velocity needed for flight, a hang-glider pilot often runs and jumps off the side of a hill or cliff to get going. The glider can trade the potential energy difference from a higher altitude to a lower altitude to produce kinetic energy. They are always descending relative to the air in which they are flying and making use of possible updrafts from pockets of rising air.



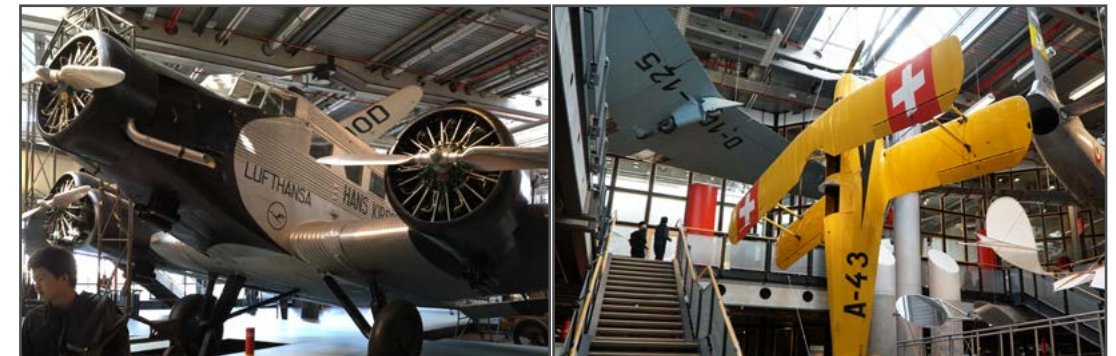
Another Lilienthal glider designed in 1895



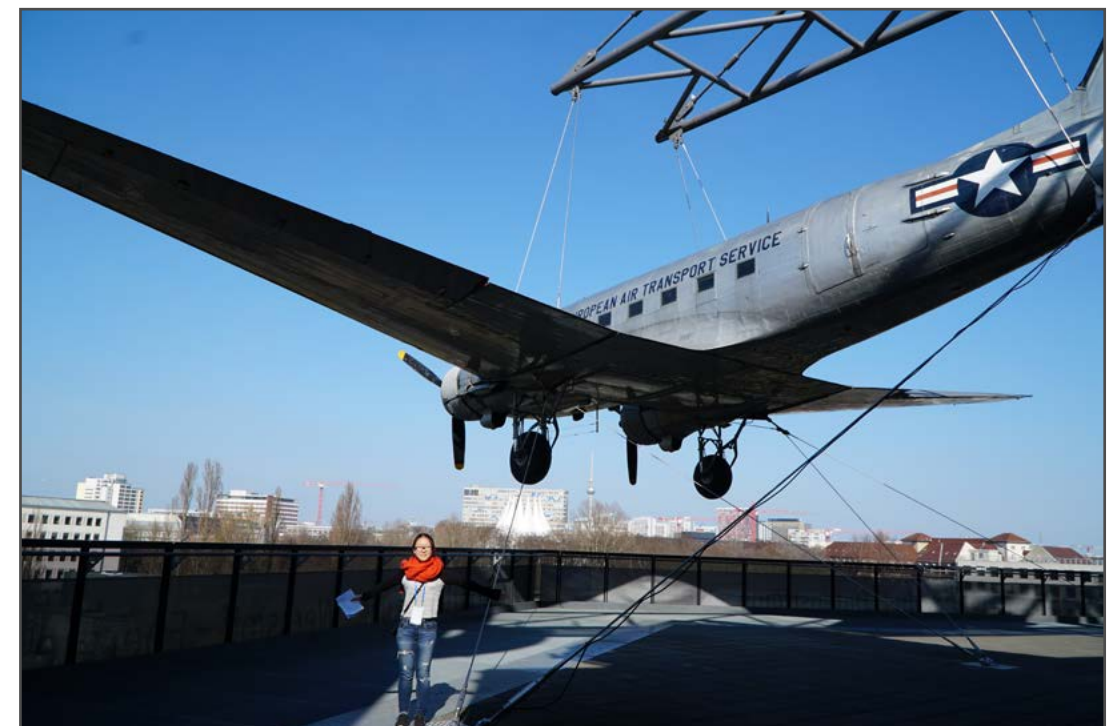
Storm Wing Model by Lilienthal designed in 1894, with a wing area of 104 sq. ft. and a wing span of 20 ft.



Students examine the details of a jet engine (Right) and a piston engine (Left), the propulsion system of an aircraft.



The Deutsches Technikmuseum Berlin has a valuable collection to show the development of airplanes, including the commercial Junkers Ju 52 airliner (Left) and the two-seated German sports aircraft, Bücker Bü 131 "Jungmann" (Right).

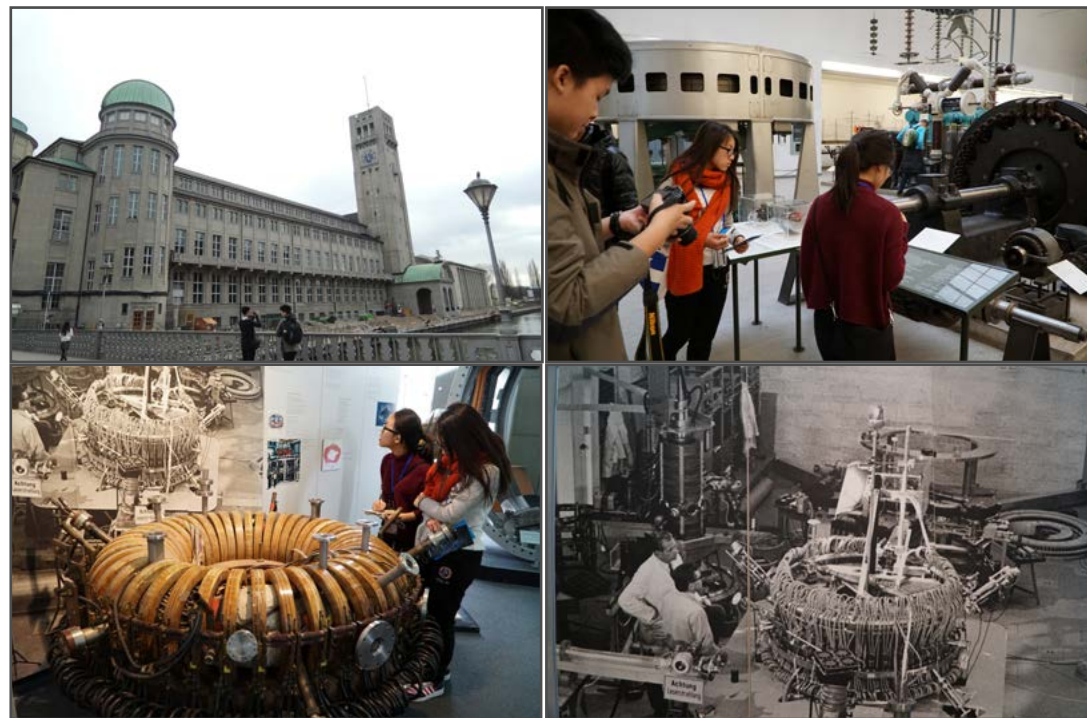


Aircrafts are also displayed in open space. A student takes the opportunity to have a memorable photo with one of those.

¹⁴ Wikipedia. Otto Lilienthal. Available: https://en.wikipedia.org/wiki/Otto_Lilienthal [last accessed 21 June 2016]

Deutsches Museum

The Deutsches Museum in Munich, founded in 1903, is the world's largest museum of science and technology. Located at the town centre on an island in the Isar River, it houses about 28,000 exhibits from 50 fields of science and technology and attracts approximately 1.5 million visitors per year. The numerous exhibits at the Deutsches Museum cover topics from aerospace, to astronomy, agriculture, computers, chemistry, electricity, energy, marine navigation, mining, music, nanotechnology railways and telecommunication. During the Second World War, the Nazi party used the museum to show propaganda films and exhibits. It was even used as a post office and as housing for Russian labourers. In 1944, near the end of the war, the building was hit by numerous air strikes. More than 80% of the structure was destroyed and more than 20% of the exhibits were damaged.¹⁵

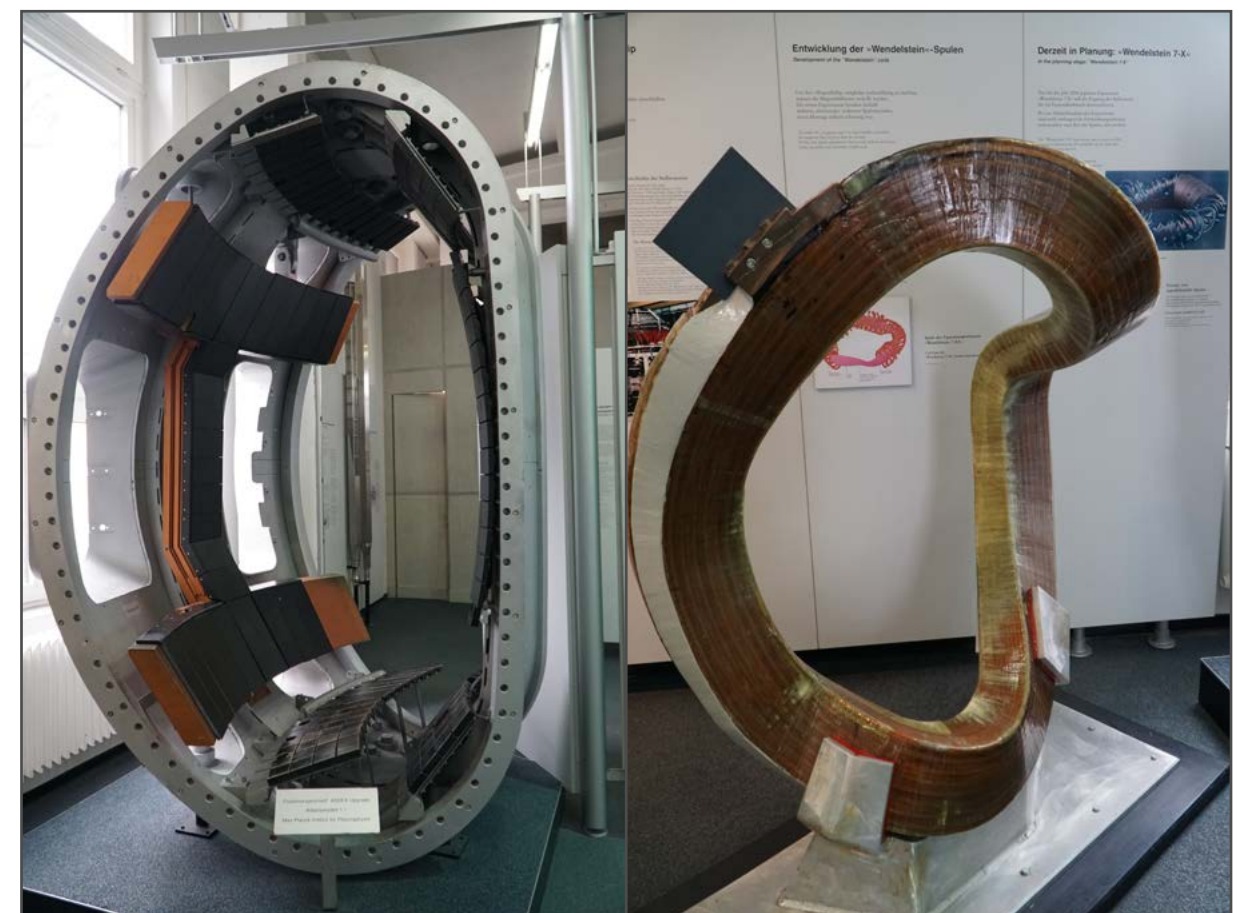


The official name of Deutsches Museum in Munich (Top-left) is "German Museum of Masterpieces of Science and Technology" (Deutsches Museum von Meisterwerken der Naturwissenschaft und Technik), where students have a busy time to learn from the science of electricity applications (Top-right) to the technology of nuclear fusion (Bottom).

A stellarator, the key component of nuclear fusion, is used to confine hot plasma with magnetic fields in order to sustain a controlled nuclear fusion reaction. It is one of the earliest controlled fusion devices, first invented by Lyman Spitzer in 1950 and built the next year at Princeton Plasma Physics Laboratory.



High voltage apparatus at 300,000 V



The photos show the non-planar super-conducting electromagnets (left) and vacuum-vessel section of magnetic confinement (right) in the nuclear fusion reactor. Magnetic confinement fusion is an approach to generate fusion power. The magnetic fields confine the hot fusion fuel in the form of plasma.

¹⁵ Wikipedia. Deutsches Museum. Available: https://en.wikipedia.org/wiki/Deutsches_Museum [last accessed 18 June 2016]

Zwinger - Royal Cabinet of Mathematical and Physical Instruments

Royal Cabinet of Mathematical and Physical Instruments (German: Mathematisch-Physikalischer Salon) is a museum of historic clocks and scientific instruments. Its holdings include historic instruments for calculating and drawing length, mass, temperature and air pressure as well as terrestrial and celestial globes, astronomical, optical and geodetic devices dating back to the 16th century. The Royal Cabinet of Mathematical and Physical Instruments is a part of the State of Art Collections in the Zwinger. The museum's most significant collections are around 3,000 clocks and fine mechanical instruments including an Arabic celestial globe from 1279, a calculating machine from around 1650 and the orbit clock manufactured in the 1560s by order of the Court of Dresden.¹⁶



Vacuum pump by Jacob Leupold in 1709



Students are studying the working principle of the vacuum pump.



Mechanical celestial globe by Johannes Reinhold and Georg Roll in 1586

The globe is a model of objects in the sky (in the celestial sphere), consisting of a spherical framework of rings, centred on Earth or the Sun, that represent lines of celestial longitude and latitude and other astronomically important features such as the ecliptic.



Newtonian Reflecting Telescope by George Hearne in 1730

The original size of the Newtonian reflecting telescope in 1667 was only 15 cm long. London optical instrument maker, George Hearne, produced mirrors for much larger instruments. They were capable of showing faint stars with insufficient brightness.

¹⁶ Wikipedia. Mathematisch-Physikalischer Salon. Available: https://en.wikipedia.org/wiki/Mathematisch-Physikalischer_Salon [last accessed 20 June 2016]



Illuminating mirror by Andreas Gartner in 1710

The surface of the mirror is made up of 342 small square plane mirrors which are fixed onto a curved wooden surface. An oil lamp at the focal point served as the source of light. Such mirrors were used to great effect at a spectacular military manoeuvre in 1730.



Encryption device, before 1587 (severely damaged in 1945)

This device is the world's oldest realization of a subtle encryption scheme. One can readily use it by shifting each letter of a message by a variable amount within the alphabet.



Gunner's sector

Gunner's sector makes it possible to determine calibre without the need for a separate gunner's gauge. The scales for iron and lead shoot up to 125 pounds and 50 pounds for stone on the arc. The length of an object in inches can also be read.



Gunner's Level by G.W. in 1591

This instrument is an elaborate gunner's level and sight, with adjustable sighting holes movable up and down the sighting frame. When the desired elevation of the barrel has been reached, the plates on the front and back are pressed onto the frame using a wing bolt.



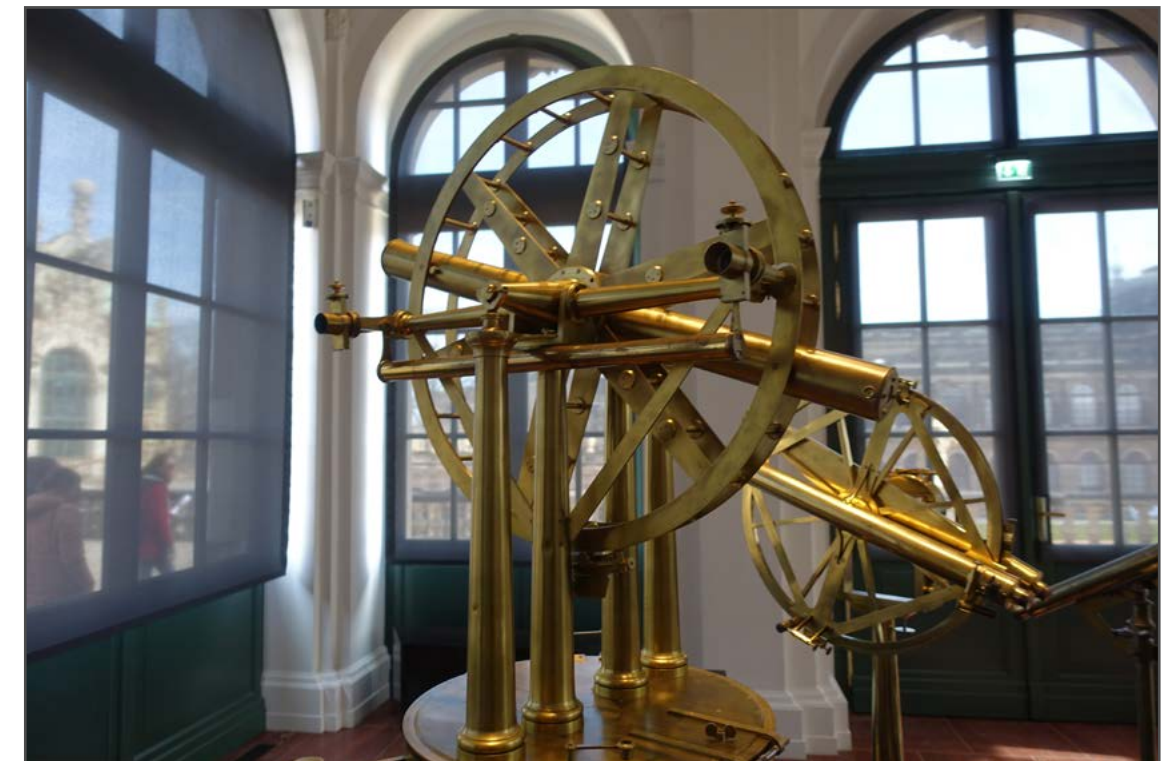
Double-lens Burning Apparatus by Ehrenfried Walther von Tschirnhaus in 1690

Sunlight collected by the large lens is concentrated onto the surface of a second lens, which then focuses it on an area roughly the size of a coin. Burning lenses are easier to use but more difficult to produce than burning mirrors.



Pendulum clock by Johann Gottfried Zimmer in 1744

It is among the earliest pendulum clocks built for astronomical observation.



Borda Repeating Circle by Étienne Lenoir in 1790

This instrument is used to facilitate repeated measurement of angles arising in astronomy or surveying. To reduce error, the user repeats each measurement several times and computes the mean value. It was used in 1792 to determine the shape and circumference of the Earth.

Audi Ingolstadt Plant

Audi Ingolstadt plant was established in 1949, and is the Audi Group's biggest production site and the second largest automobile plant in Europe, with more than 43,000 employees producing 560,000 automobiles in 2015. Audi started out producing spare parts, motorcycles and DKW vehicles in Ingolstadt's former fortress. In 1985, Auto Union GmbH became AUDI AG, and the company and its products have borne the same name ever since. The Ingolstadt site is AUDI AG's most important location where the Audi A3, A4, A5, Q2 and Q5 car lines are built.¹⁷



The entrance of Audi Forum Ingolstadt



Reception for plant tours



The building of "Market and Customer"



Latest model of electric car



Audi Museum Mobile presents the historical exhibits of the manufacturer in contemporary forms.

Production Process of an Audi

The ensemble of buildings, with stylish glass architecture, grouped around a central piazza has impressed visitors since it opened in 2000. With an area of 77,000 m², each year it attracts more than 400,000 visitors. Audi employs 2,400 apprentices aged 15 to 18. Each year, 715 apprentices complete their education and start a career at Audi. Their retention rate is 100%. German apprenticeship programs are requisite for finding work after school.¹⁸



Audi's base frames are made from either steel or aluminium, and every other piece of the car body is made of galvanized sheet steel or a new aluminium alloy. Galvanizing prevents corrosion, while aluminium alloys save weight and look futuristic.



Teams of robots pluck stamped parts from overhead conveyor belts or forklifted stacks and begin to fit them together as teams. Parts zoom overhead, welding crackles and the sweet, guilty smell of glue drifts freely.



Thin metal is "remote welded" with lasers to reduce heat warping. Alignment is spot-checked by lasers before and after each operation. Some procedures require the use of six or more precision jigs to hold the parts square.



Every component is epoxied in place by accurate tube-welding robot arms, squeezed into place by robotic vices, and spot welded by copper-tipped robot fingers. The hyper-jointed arms of the welders and gluers are flexible and accurate.

¹⁷ Audi AG . Ingolstadt. Available: <http://www.audi.com/index.html> [last accessed 22 June 2016]

¹⁸ Core77 How to Make an Audi in 20,000 Basic Steps. Available: <http://www.core77.com/posts/25731/How-to-Make-an-Audi-in-20000-Basic-Steps> [last accessed 22 June 2016]



Random quality checks are conducted on one car type per shift. Once a month, an entire car is demolished to do stress checks on all attachment points and to analyse overall build quality.



The assembly process is broken up into different stations, each manned by one or more employees to perform a certain task. Each station has exactly 80 seconds per car to perform its duties before the car is moved to the next station.



The painting facility is also highly automated. A mechanized conveyor belt trundles the car bodies along, each with its black box to identify the model and make its intended paint color. This is useful because all of the painting is done by robots.



The whole car frame spins almost 360 degrees and every painted surface is manually checked for imperfections. The cars pass under a series of white and yellow lights, as different wavelengths highlight different types of inconsistencies, some catching contamination or drips, others picking up cracks and low spots. The key tools used are a white grease pencil and tiny fine buffing bits. Unless deemed irreparable and unworthy, each car leaves the paint shop ready to be fitted with its engine.



At the end of the line the car is filled with the necessary liquids and the engine is started for the first time. From there the cars are brought to the loading docks to be shipped by train or by truck to the dealership.

Audi Museum

Museum Mobile is an automobile museum owned and operated by Audi AG in Ingolstadt, Bavaria, Germany. Opened in 2000, the museum is devoted to the history of Audi, and its predecessors, and is the focal point of the Audi Forum Ingolstadt

The museum is housed within a circular glass and steel building over 22 m high. The building was designed by Gunter Henn under the creative direction of Michael Keller and Christoph Rohrer. There is a permanent exhibition of about 50 cars and 30 motorcycles and bicycles, as well as numerous other exhibits relating to the history of the Audi, DKW, Horch, Wanderer and NSU brands. A special feature of the museum is a paternoster which displays 14 cars in constant motion.



Students have a group photo outside the Museum Mobile.

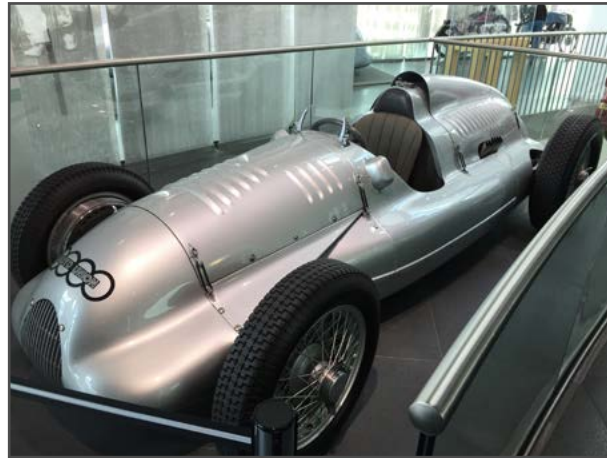


14 cars are displayed on the paternoster.



Various types of engines and mechanical parts used in Audi Mobile

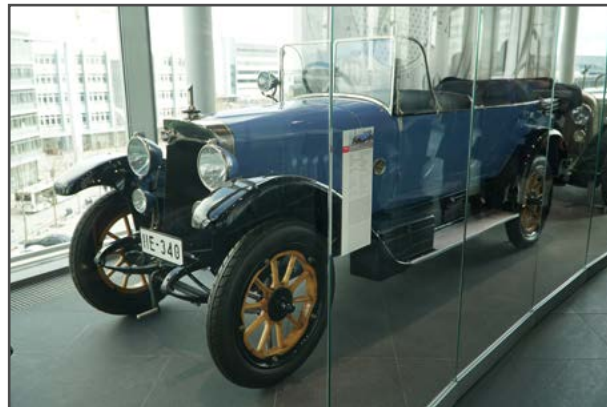
Classic Audi Cars



Auto Union Grand-Prix-Rennwagen Type D

Year of manufacture: 1938-1939

Auto Union engineers led by Robert Eberan-Eberhorst developed the 12-cylinder Auto Union Type D racing car with mid-engine installation, torsion bar suspension and compressor engine based on the 16-cylinder Type C predecessor.



Audi 8/22 PS Type G

Year of manufacture: 1914-1926

The Type G existed before the First World War. In 1914, it was presented as a “small”, inexpensive Audi with a 22 HP four-cylinder engine. It was the first Audi to have a block engine rather than cylinders cast in pairs. Production of the slightly modified Type G started after the war, with a slightly more powerful engine and a striking pointed radiator.



Audi 72 Limousine

Year of manufacture: 1965-1968

The outstanding feature of this car was its “medium-pressure engine”. The four-cylinder four-stroke 72 HP engine had an unusually high compression ratio (1:11.2) and very high efficiency. The car had a front-wheel drive and provided the basis for a new generation of models.



Auto Union Type C

Year of manufacture: 1937 and 1999

The Type C represented the most powerful development stage of the Auto Union 16-cylinder racing car, which was developed up to 560 hp. The Streamliner celebrated its debut at the 1937 Avus Race, where the new banked curve was driven on for the first time. The model in the photo is a reproduction of the 1937 version.



Auto Union Type C/D

Year of manufacture: 1939

In 1938 Auto Union built a hill-climbing racing car that was a special combination of the old Type C and the new Type D. Due to a change in Grand Prix regulations, this engine was only used in hill-climbing races, while the new Type D with 12 cylinder supercharged engine was used in Grand Prix races.



Horch 8 Type 303, Phaeton

Year of manufacture: 1926-1927

Phaeton was one of Germany’s first eight-cylinder models. The inline eight-cylinder engine with double overhead camshafts was designed by Paul Daimler. Even the most basic version of this model, an open tourer, rated among the top luxury vehicles in Germany.



Horch 855 Special-Roadster

Year of manufacture: 1938-1939

Horch 855 Special-Roadster was one of the most expensive and most exclusive Horch cars in Audi’s history. Only seven of these cars were built. The magnificent body was manufactured by Glaser in Dresden.

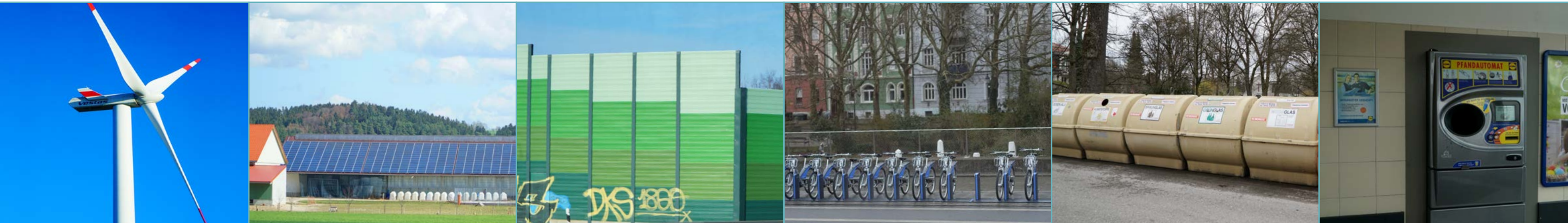


Horch 10-12 PS

Year of manufacture: 1902-1903

The engine of this model has two vertical cylinders and was quoted at between ten and twelve horsepower. The model has a “tonneau” body with two rows of seats and has unusual accessibility to the back seats from the rear.

Environment



Environmental policy has been extensively implemented in Germany. No matter where you are, there is a lot of environmental-related facilities or practices surrounding you.

Environment

Germany is internationally considered one of the forerunners in environmental protection and a pioneer of developing renewable energies. Germany was the first nation to decide shutting down all nuclear power by 2022. Power production will be made up by photovoltaics, wind turbines, and conservation. On 8 May 2016, at 11 a.m. local time, for a brief, shining moment, renewable power output in Germany reached 57.8 GW or 95% of the country's total electricity demand

During our visit, we have had a better understanding from Roland Berger, the energy policy in Germany; and from Munich Re Group, the financial effect of environmental hazards. Throughout our stay in Germany, especially on the streets or through the highways, we observed how environment policy was underway in real life.

Solar Energy

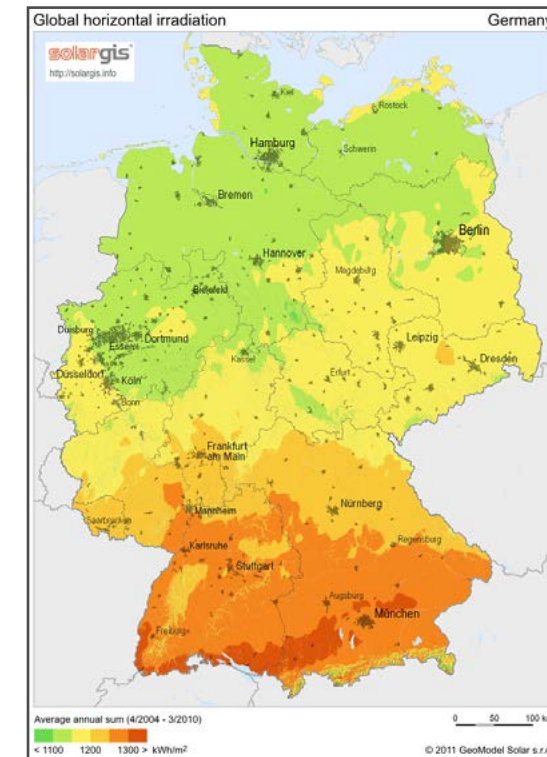
Solar power in Germany consists of photovoltaics (PV) and accounted for an estimated 6.2% to 6.9 % of the country's renewable generation in 2015. The country has been the world's top PV installer for several years, that amounted to 40 000 megawatts (MW) by the end of April 2016, behind China and ahead Japan, Italy and the United States.

About 1.5 million photovoltaic systems are installed all over the country, ranging from small rooftop systems, to medium commercial and large utility-scale solar parts, that altogether contributed 35.2 terawatt-hours (TWh), or about 6.9% in 2015. This brings the country's share of renewable electricity to about 31%, and in line with the official governmental goal of reaching 35% by the end of the decade.

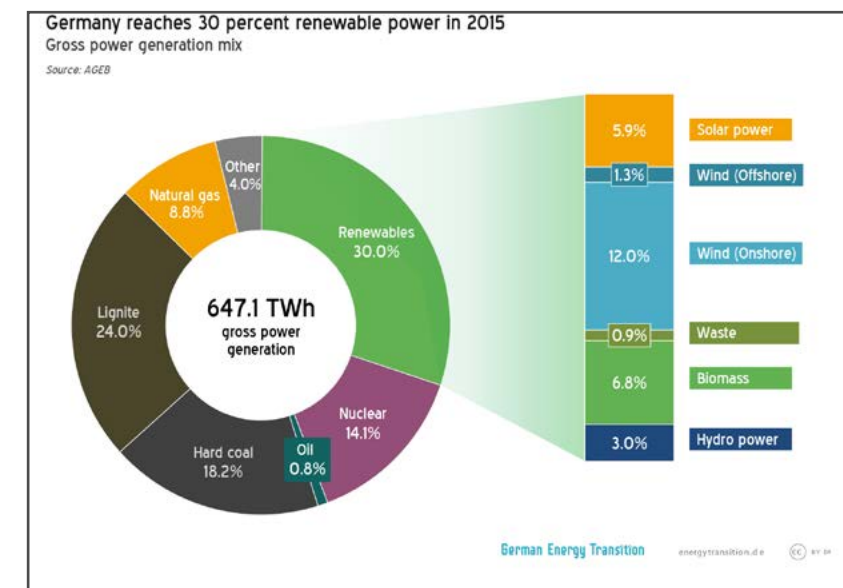
The official governmental goal is to continuously increase renewables' contribution to the country's overall electricity consumption. Long-term minimum targets are 35% by 2020, 50% by 2030 and 80% by 2050. The country is increasingly producing more electricity than it needs, driving down spot-market prices and exporting its surplus of electricity to its neighboring countries (record exported surplus of 32 TWh in 2013 and 34 TWh in 2014).

Germany is leaving the fossil-nuclear age behind, paving the way for photovoltaics to play a significant role in a future shaped by sustainable power production. In 2015 Germany installed about 1.3 GW new photovoltaic capacity, which corresponds to about 2% of new installation worldwide. The largest solar farms in Germany are located in Meuro, Neuhardenberg and Templin, with capacities beyond 100 MW. Also, concentrated solar power (CSP) has no significance for Germany as this technology demands much higher solar insolation. There is a 1.5 MW experimental CSP-plant used for on-site engineering purpose rather than for commercial electricity generation.

In the German Renewable Energy Act 2014, the federal government has set an annual target of 2.5 GW, and a total of 200 GW photovoltaic capacity is to be installed by 2050. In fact, Solar energy has already contributed 38.5 TWh to the power supply in Germany, which covered around 7.5% of Germany's net electricity consumption in 2015.



Solar Potential Map – Germany¹



A chart showing the distribution of different form of energy generated in 2015²

1 Solargis. Free Maps. Available: <http://solargis.com/products/maps-and-gis-data/free/overview/> [Last accessed 28 June 2016]

2 Greentech Media. Germany reaches 30 percent renewable power in 2015. Available: <http://www.greentechmedia.com/> [Last accessed 28 June 2016]

Wind Energy

In 2015, wind power production in Germany already reached the highest record of 34.8 GW, 66% more than 2014. Nationwide, wind energy accounted for 13.3% of German electricity generation in 2015, the third largest fleet of wind turbines worldwide and for the first time producing more electricity from wind turbines than that from lignite power plants. Germany already set the wind power target for 2020 as 45.75 GW, of which 10 GW will be offshore.



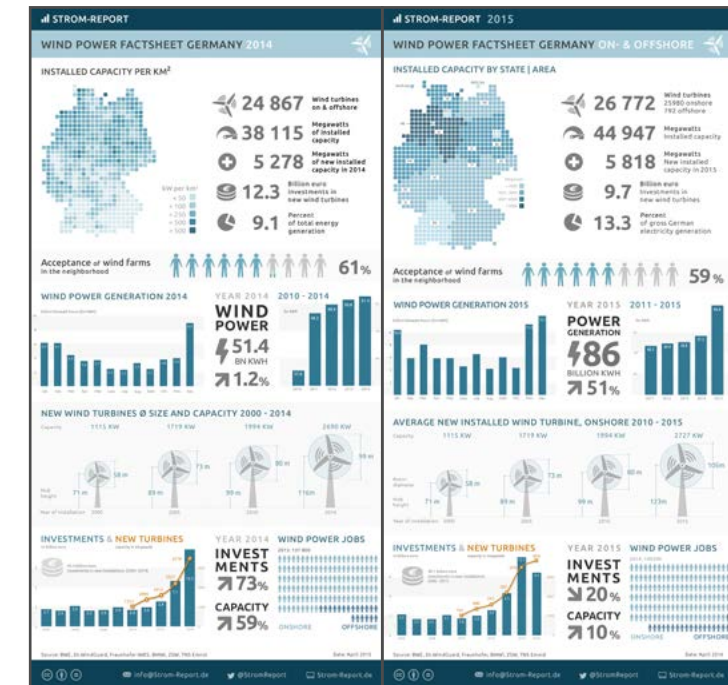
A solar panel farm located at the side of a highway



The roofs installed with solar panels, supplying 35% of the momentary electricity demand on sunny weekdays



A photovoltaic powered automated payment machines for car parking



Rapid growth of wind power in Germany (Strom-Report 2015)³



Numerous wind farms are located at the sides of the highway from Berlin to Munich

Transportation

Germany has extensive public and bicycle transportation networks, both which reduce fossil fuel dependence. Over 200 long-distance bicycle paths cross the country in 70,000 km of well-maintained trails, and cities like Berlin have made bike-friendly traffic improvements as a part of their environmental conservation policy. The public transportation network is very extensive, convenient and efficient. About 88% of Germans live in the area with the coverage of public transportation network.



Various types of transportation are available in Germany, including metro, light railway, bus and rental car.



Eco taxi, a hybrid vehicle, has been launched under the project called Eco-Taxi Munich. Compared to traditional diesel vehicles, it reduces carbon dioxide emission by 50%, equivalent to 400 tonnes of carbon dioxide per year.



Citizens can rent a bicycle or a scooter easily for short tours or sightseeing.



Photos show the Registration and Safety Seals on German License Plates. They indicate the schedule of regular safety checking of vehicle. Exhausted gas emission is also included as the criteria to pass the safety checking.

Recycling in Germany

Germany has a selective system of waste disposal. Since the local authorities are in charge of waste management, this can vary from town to town. In Munich, recycle bins with different color are used for identifying types of recycling items such as aluminium can, glass in green color, brown color or white color, plastic item or clothes.



Different recycle bins are used for different items.

The "Pfandautomat"

"Pfandautomat" is a machine at the entrance or somewhere else in the market, where empty bottles or cans are deposited in return of money. This is a means of recycling and waste prevention. Instead of hard cash, the machine will issue a ticket in exchange for money at a cash counter. One will get 8 cents for a beer bottle, 15 cents for deposit bottle ("Mehrwegflasche") and 25 cents for disposable bottle ("Einwegflasche").

When you put a bottle or can into a Pfandautomat, the machine will read barcode on the container. If accepted, you can see on the display how many bottles etc. you have already returned and how much money you get for it. Otherwise, the container will be pushed out and should be thrown away in ordinary trash bins. You can get money back only for those imprinted with "Pfandflasche/Mehrweg" (returnable bottle / reusable).



Pfandautomat is a smart machine for recycling

Sound Barriers

Traffic noise is a serious problem in Germany. In 2012, German Government had conducted a survey on the disturbance of noise pollution. 54% of Germans are disturbed by traffic noise, 34% by train noise and 23% by aircraft noise. Because of it, German Government puts a heavy investment on solving traffic noise by building soundproofing walls along the highways in Germany.

Noise is undesirable sound. Highway traffic noise is the major source of noise pollution both in the urban and rural areas. Traffic noise originates mainly from vehicle engines, tires and aerodynamics. Sound barriers are the most effective in reducing traffic noise as well as noise from industrial sources. Sound barriers can insulate, absorb, or reflect sound waves. They are usually composed of modular wall panels made of various materials. Rock mineral wool, high-quality aluminum alloy, timbers from preserver impregnated pine or other woods, etc., are used for opaque designs. glass, polycarbonate, silicate glass etc. are used for transparent walls. Apart from superb acoustic performance, the boards are finished for mechanical stability, high aging and corrosion resistance.

Due to increased environmental awareness, current sound barrier systems aim to be more environmentally friendly and exploit the structures as growing media for different types of plants. They serve to mitigate noise within a confined space and at the same time to make the barriers more aesthetically pleasing. Even photovoltaic elements are incorporated in some design to absorb sun energy as well as sound energy. Transparent sound barriers become more popular to provide a pleasant appearance and landscape to the road users and as well as the transparent noise protection for the residents. Curved noise barrier systems provide a futuristic sensation and have the advantage of offering improved noise reduction while lower the height of the barrier, meeting the highest demands on design and functionality.



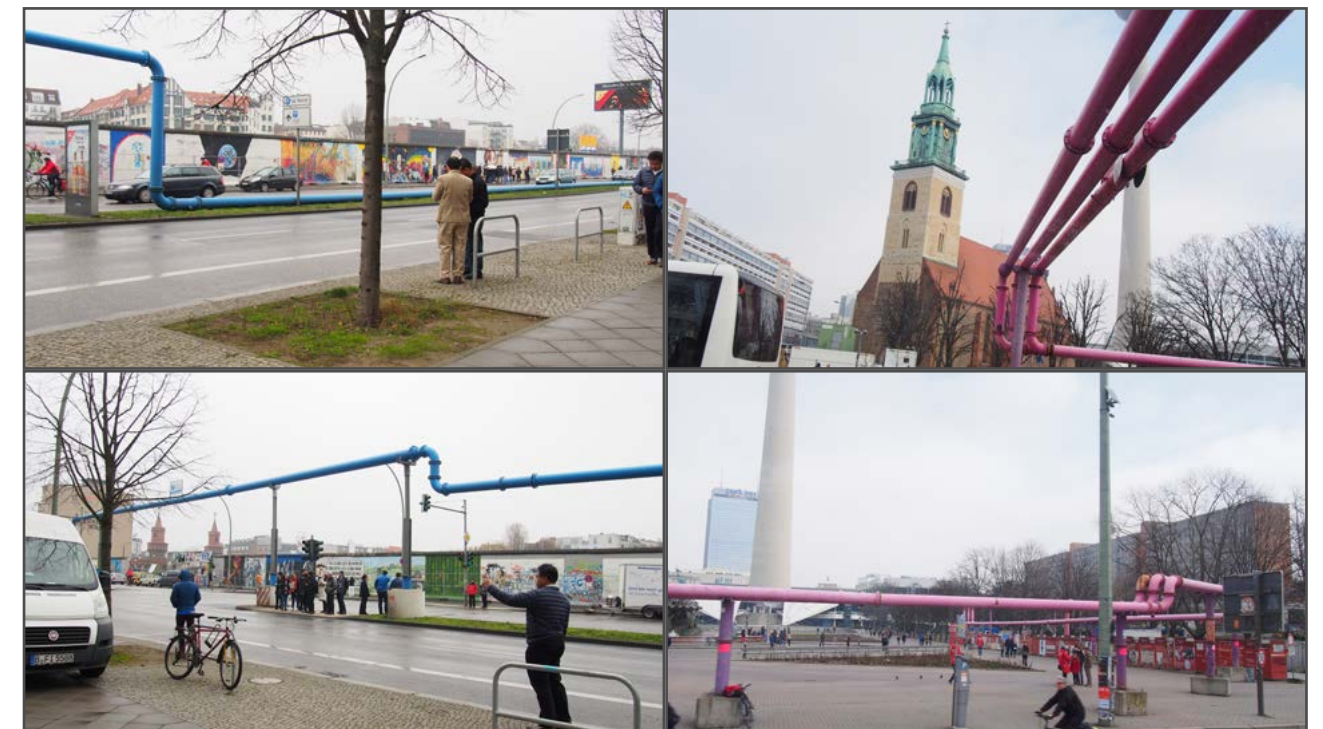
Sound barriers are made of different types of materials.

Above-ground water pipes in Berlin

These are the water pipes in the city center of Berlin. Compared to those in Hong Kong, they are constructed above ground instead of underground for saving the maintenance cost and building cost. As Berlin is built on swampy region, where the groundwater existing just two meters under the city's surface. These pipes surrounding Berlin serve to pump water from the ground and transport it to the canals, allowing both together to drain the basements of the city and to facilitate the urban works.



Curved barriers have improved noise reduction while lowered the barrier height.



Overhead water pipes are common in Berlin streets.



Transparent barriers provide better visual effects to road users and residents.

Biodiversity



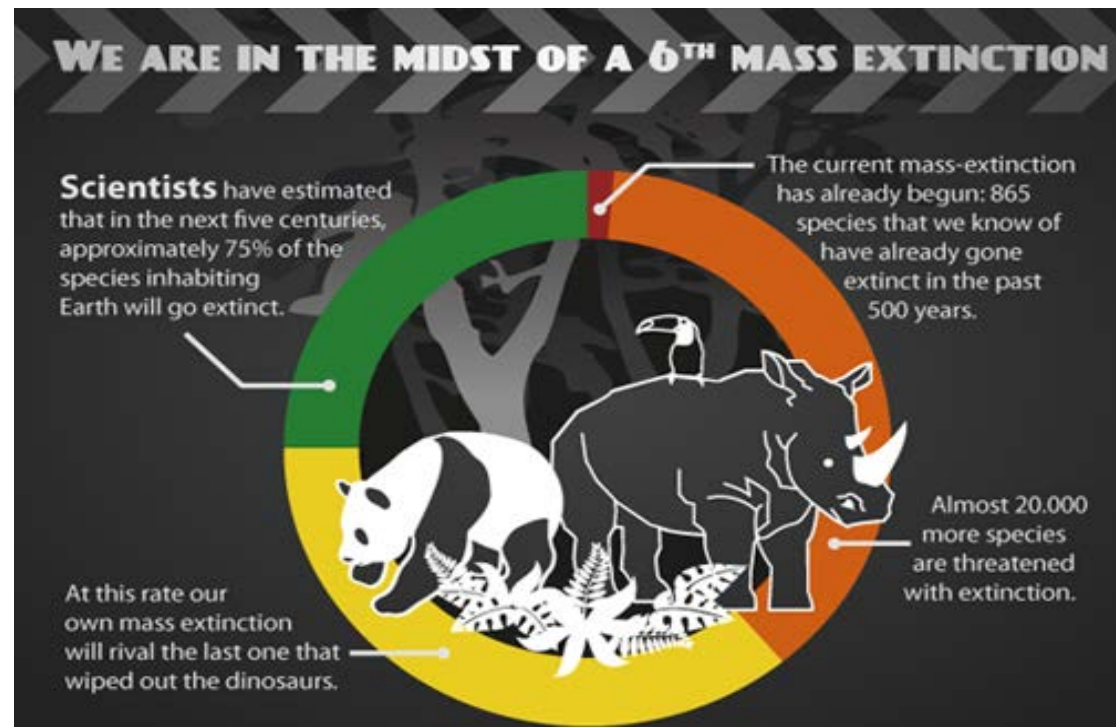
We're losing biodiversity globally at an alarming rate, and we need a cornucopia of different plants and animals, for the planet's health and our own.

- Diane Ackerman

The Sixth Mass Extinction

Scientists have been warning for decades that human actions are pushing life on our shared planet towards mass extinction. Such extinction events occurred five times in the past. Periodically, in the vast spans of time that preceded us, our planet's living beings had been purged by planetary catastrophes so extreme they made the typical Ice Age look like the geological equivalent of a stroll in the park. Scientists count just five mass extinctions in an unimaginably long expanse of 450 million years, and yet the sixth may well be coming.

How can we avoid the Mass Extinction? The scientists agree that it is possible to avoid mass extinction and tackle the current environmental crisis. Practical solutions will require a combination of conservation, restoration, rewilding, engineering, emergence and design. The promotion of the awareness of the plight of biodiversity in education also plays a very important role.

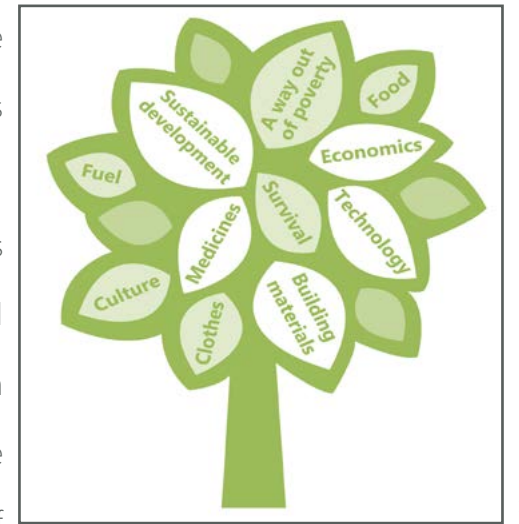


Biodiversity Education in CFSS

Sustainable Development (SD) has been a major area of concern of our School since the establishment of the School in 2000. With the establishment of: CFSS Environmental Trail, Science & Sustainable Development Resource Centre (SSDRC), Chinese Medicinal Herb Garden, Organic Farm and Geology & Climate Change Resource Centre (GCCRC), the students are provided many opportunities

around the school campus to practise environmental conservation and investigate biodiversity. It is our School's major goal to promote species conservation and to act against the potential Sixth Mass Extinction of Species.

Biodiversity has been a theme in most education tours organized by the School. In the Germany Education Tour, we had precious chance to visit Berlin Zoological Garden and Munich Botanical Garden and so it is hoped that our sharing can arouse people's interest in and attention towards the conservation of biodiversity.



Animal Biodiversity

Germany, the third largest economy in the OECD, has made a concerted effort to enforce ambitious environmental policies formulated during recent decades, acting both nationally and internationally. The country's strong environmental framework makes it not only a pioneer of environmental protection and sustainable development, but also a good example of how a cleaner low-carbon economy is compatible with growth. [Refer to document at: <http://www.oecd.org/greengrowth/greengrowthinactiongermany.htm>]

Germany is not host to a particularly unique array of animal or plant life, yet its many national parks, nature parks, and biosphere reserves are nursery grounds for trees, plants, shy mammals and birds. On a satellite map, Germany is a swirling sea of green. In a country where a major political party—die Grünen—built its platform on environmental stewardship, the conservation of Germany's environment is a major government concern.

Germany's forests are home to wild boars, rabbits, deers, pheasants, and the more exotic ibexes living in the Alpine region. The most common animals are Eichhörnchen (squirrels), groundhogs, badgers, hedgehogs, and Martens, little weasel-like animals that are notorious for climbing into cars and chewing through cables. While in the Alps, look out for the chamois, a horned, goat like antelope that spends summers scampering around mountaintops and winters in the warmer valleys.

¹ Kyle McDermott. Sixth Mass Extinction. Available: <http://transudationism.blogspot.hk/2014/07/earths-sixth-mass-extinction-is-now.html> [last accessed 28 June 2016]

² 5m Publishing. Biodiversity. Available: <http://www.thecropsite.com/focus/5m/53/biodiversity-protecting-the-natural-world-importance> [last accessed 28 June 2016]

Berlin Zoological Garden: A platform for learning mammal diversity



A group photo taken at the entrance of the Berlin Zoological Garden

The Berlin Zoological Garden (German: Zoologischer Garten Berlin) is the oldest and best known zoo in Germany. Opened in 1844, it covers 35 hectares (86.5 acres) and is located in Berlin's Tiergarten. With about 1,500 different species and almost 20,500 animals, the Zoo presents the most comprehensive collection of species in the world. The Zoo collaborates with many universities, research institutes, and other zoos around the world. It makes a concerted effort to maintain and promote European breeding programs, helps safeguard several endangered species, and participates in several species re-introduction programs.

To explore species diversity, students were divided into 4 groups and each was assigned the target taxonomic groups. Equipped with the Zoo Map and instructions, students planned their routes to explore on the endangered species and mammals.

Our students studied the description of each species carefully and had on-site discussion to relate their findings to the concepts acquired in the pre-trip training workshops. Their observations included morphological, behavioral and evolutionary studies.



The map helps students to plan their routes.



A student is reading the descriptions in details.



The group extracts information on morphology of the species.



Natalie is taking record of the information from the display board.



Students spy on how animals behaved or otherwise their behaviors would be disturbed.



The Zoo displays diversity on primates.



The Zoo provides good platform so that visitors can learn animal biodiversity at ease.

Endangered Animals

Germany's Biodiversity at Risk

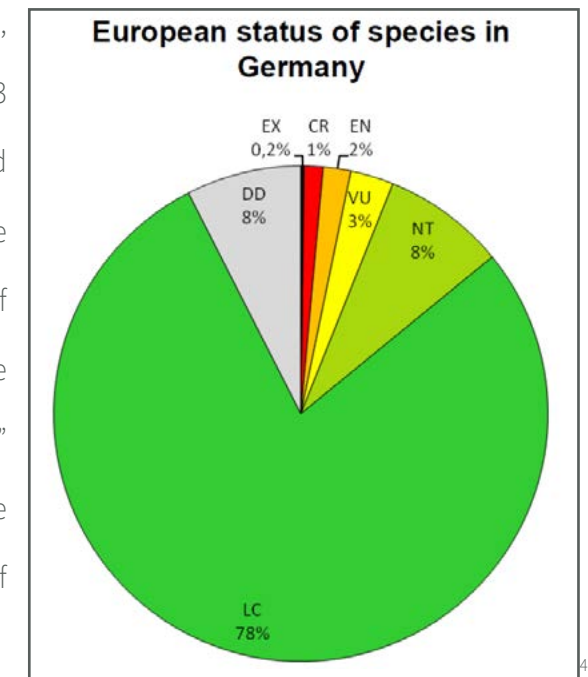
Despite having high biodiversity, Germany is fighting a battle against the same toxic cocktail of environmental threats that the other developed nations are facing: pollution from industrialization and emissions from cars, trains, and planes. Despite high-tech efforts to help with conservation, Germany's flora and fauna are suffering terribly. The difficult-to-counter effect of global warming is plaguing the country's birds, with 23 of the 64 most common species, (including the common house sparrow and house martin), declining in population over the past 15 years.

The European Red List of Endangered Species

The European Endangered Species 'Red List' is a review of the conservation status of around 6,000 species present in Europe detailed according to the IUCN Red List framework and the regional Red List guidelines. It identifies species that are threatened with extinction so that appropriate conservation measures can be taken to improve their status.



occur in Germany are particularly high; such as dragonflies, saproxylic beetles, butterflies and mammals. Of the 1,383 species assessed that occur in Germany, 6% are considered "Threatened" and at least 8% are "Near Threatened" at the European level, and three species are already extinct. Many of these species are endemic to Europe and are found nowhere else in the world. Species that are considered "Threatened" are found mostly in wetlands, forests and grasslands. These ecosystems require particular attention for conservation of these sensitive species.



Number of species assessed within each IUCN Red List category at the European level

Species group	No. of sp. in Europe	No. of sp. in Germany	% of European sp. occurring in Germany	No. of threatened sp. in Germany (status at European level)		
				CR	EN	VU
Mammals	233	98	42%	2	1	4
Reptiles	140	14	10%	0	0	0
Amphibians	83	21	25%	0	0	0
Freshwater fishes	522	93	18%	7	1	6
Butterflies	435	184	42%	0	4	6
Dragonflies	137	79	58%	0	0	2
Saproxylic beetles**	431	209	48%	0	6	4
Terrestrial molluscs**	1,233	109	9%	0	3	2
Freshwater molluscs	854	127	15%	8	7	10
Vascular plants**	1,826	449	25%	0	3	5
TOTAL	5,894	1,383	23%	17	25	39

**Not comprehensively assessed, selected species only.
This table does not include the Not Applicable (NA) species in Europe (species introduced after AD 1500 or species of marginal occurrence).
The data are based on the results of the European Red List (European region wide assessment).

Major threats

Habitat loss, fragmentation and degradation are the most significant threats at the European level to species that occur in Germany. For freshwater species, major threats include the over-extraction of water, which in many cases is further exacerbated by increasing droughts due to climate change, pollution and the introduction of alien species. Other major threats come from consumptive use of natural resources such as wood or animal products and farming and ranching as a result of agricultural expansion and intensification, urbanization and tourism.⁴

Preserving biological diversity is a top priority for the German government. The populations of the relevant species enjoy a favorable conservation status in relation to their respective biogeographical region, live in permanently protected, interlinked habitats of adequate size for the species and habitats in question, and are available for humans to experience.

³ International Union for Conservation of Nature. Germany's biodiversity at risk. Available: https://cmsdata.iucn.org/downloads/germany_s_biodiversity_at_risk_fact_sheet_may_2013.pdf [last accessed 28 June 2016]

⁴ International Union for Conservation of Nature. Germany's biodiversity at risk. Available: https://cmsdata.iucn.org/downloads/germany_s_biodiversity_at_risk_fact_sheet_may_2013.pdf [last accessed 28 June 2016]

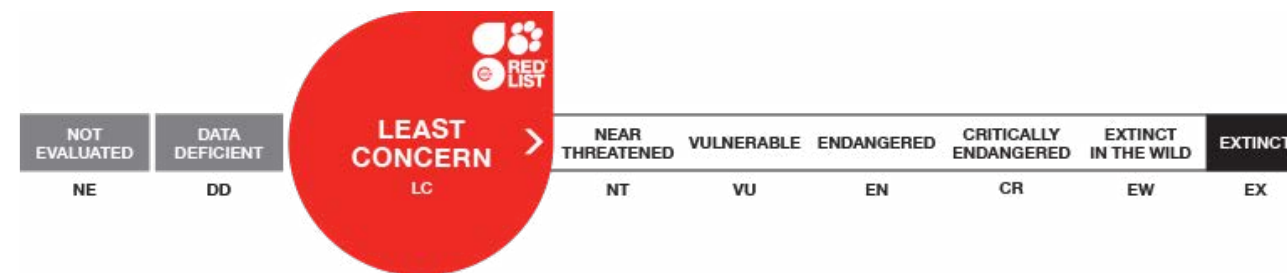
Species in IUCN Red List of Endangered Species

The risks the species are facing can be categorized into different level by IUCN as follows:

EX	Extinct	No reasonable doubt that the last individual has died.
EW	Extinct in the wild	Known only to survive in captivity or as a naturalized populations well outside its previous range.
CR	Critically endangered	The species is in imminent risk of extinction in the wild.
EN	Endangered	The species is facing an extremely high risk of extinction in the wild.
VU	Vulnerable	The species is facing a high risk of extinction in the wild.
NT	Near threatened	The species does not meet any of the criteria that would categorise it as risking extinction but it is likely to do so in the future.
LC	Least concern	There are no current identifiable risks to the species.
DD	Data deficient	There is inadequate information to make an assessment of the risks to this species.

In our visit to Berlin Zoological Garden, we focused our study on mammal diversity and particularly the species at risk. We identified four animal species on the IUCN Red List of Endangered Species.

Lowland Baird's Tapir (*Tapirus terrestris*) – Least Concerns



Lowland tapirs are excellent swimmers and divers, but can also move quickly on land, even over rugged, mountainous terrain. In the wild, their main predators are crocodilians and they have a life span of approximately 25 to 30 years. The tapirs are herbivores and by using its mobile nose it can tear off leaves, buds, shoot, and small branches from trees. It also eats fruit, grasses, and aquatic plants.



Dwindling numbers are due to poaching for meat and hide, as well as habitat destruction. The species is generally recognized as an endangered animal species, with the species having been designated as endangered by the United States Fish and Wildlife Service on 2 June 1970. Thankfully, this measure has significantly lowered the risk of extinction.

Sloth Bear (*Melursus ursinus*) – Very Vulnerable



The sloth bear, also known as the labiated bear, is a nocturnal insectivorous bear species found wild within the Indian Subcontinent. Sloth bears are expert hunters of termites, which they locate by smell. On arriving at a mound, they scrape at the structure with their claws till they reach the large combs at the bottom of the galleries, and then disperse the soil with violent puffs. The termites are then sucked up through the muzzle, producing a sucking sound which can be heard 180m away. Their sense of smell is strong enough to detect grubs three feet below ground. Unlike other bears, they do not congregate in feeding groups. They rarely prey on other mammals. Sloth bears may supplement their diet with fruit and plant matter.

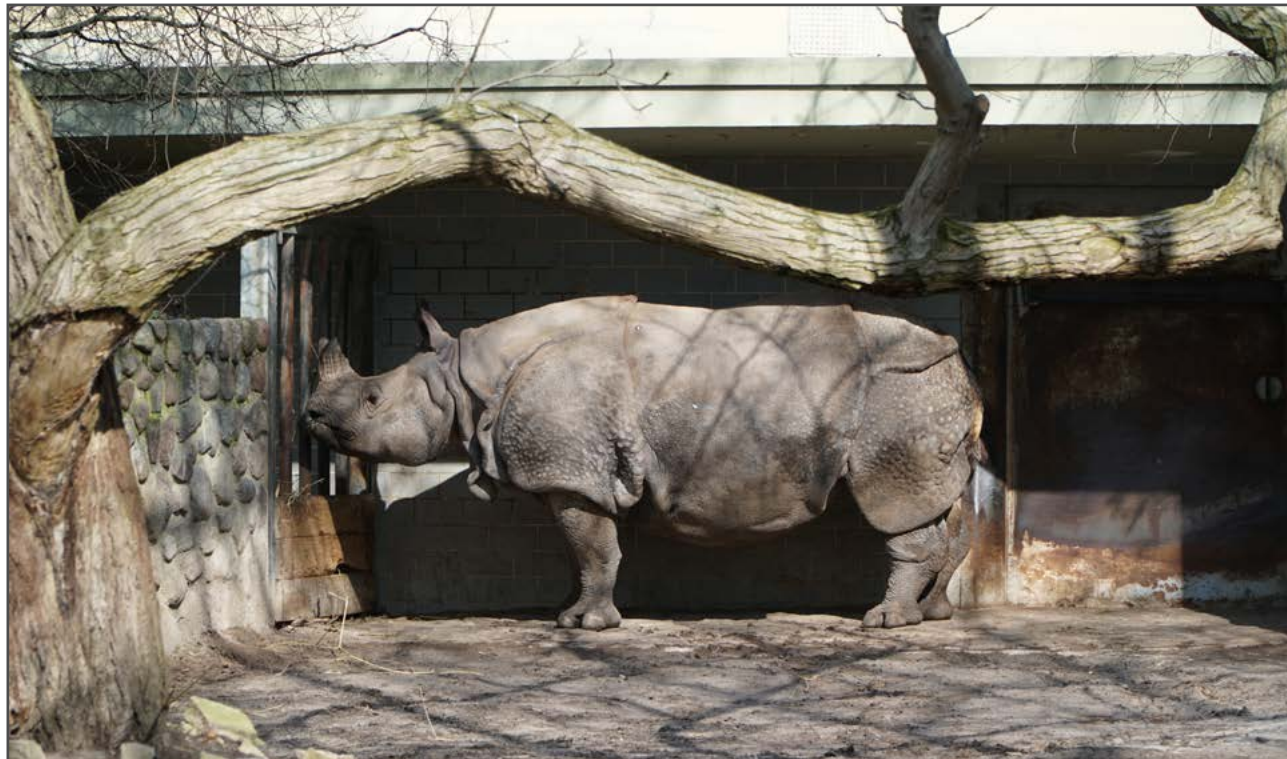


It is estimated that there are only 20,000 or fewer animals. Moreover, there is strong evidence that their population has declined by 30%-49% over the past 30 years; largely as a result of habitat loss, and to some extent from exploitation for parts, or systematic elimination as a pest.

Indian Rhinoceros (*Rhinoceros unicornis*) – Endangered



The Indian rhinoceros has a thick grey-brown skin with pinkish skin folds and a black horn. Its upper legs and shoulders are covered in wart-like bumps. It has very little body hair, aside from eyelashes, ear fringes and a tail brush. Males have huge neck folds. The rich presence of blood vessels, underneath the folds of skin, gives it the pinkish colour. The folds in the skin increase the surface area and help in regulating body temperature.



Rhinos are mostly solitary creatures, with the exception of mothers, calves and breeding pairs, although they sometimes congregate at bathing areas. The Indian rhinoceros once ranged throughout the entire stretch of the Indo-Gangetic Plain, but excessive hunting and agricultural development has reduced their population drastically to 11 sites in northern India and southern Nepal. In the early 1990s, between 1,870 and 1,895 rhinos were estimated to have been alive. In 2015, a total of 3,555 Indian rhinoceros are estimated to live in the wild.

African Penguin (*Spheniscus demersus*) – Endangered



The African penguin is a pursuit diver and feeds primarily on fish and squid. Like all extant penguins it is flightless, with a streamlined body, and wings that are stiffened and flattened into flippers for a marine habitat. It has distinctive pink patches of skin above the eyes and a black facial mask; the body upperparts are black and sharply delineated from the white underparts, which are spotted and marked with a black band. The pink gland above their eyes helps them cope with changing temperatures.



Penguins remain susceptible to pollution of their habitat by petrochemicals from spills, shipwrecks and the cleaning of oil tankers while at sea. In addition, commercial fisheries of sardines and anchovy, which constitute the two main prey species of the penguins, have forced these penguins to search for prey farther off shore, as well as having to switch to eat less nutritious prey. Roughly 4 million penguins existed at the beginning of the 19th century. Of the 1.5-million population of African penguins estimated in 1910, only some 10% remained at the end of the 20th century. In 2010, the number was estimated to be only at 55,000. If this decline is not halted, the African penguin is expected to be extinct within 15 years.

Mammal Diversity

Besides the four endangered species identified, we also came across a lot of other species in the Zoo. Below is a gallery of mammals and birds we observed in the Zoo:



Antilope



Asian Elephant



Brown Bear



Gaur



Gemsbok



Gemsbok



Giraffe



Hippopotamus



Hippopotamus



Hippopotamus dentition



Lama



Lowland Baird's Tapir



Nyala, female



Nyala, male



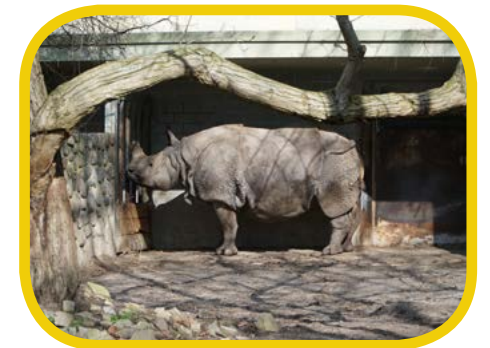
Plains Zebra



Polar Wolf



Prevost's Squirrel



Rhinoceros unicornis



Slender-tailed meerkat



Sloth bear



South African Fur Seal



Sumatran Orang-utan



Toque Macaque

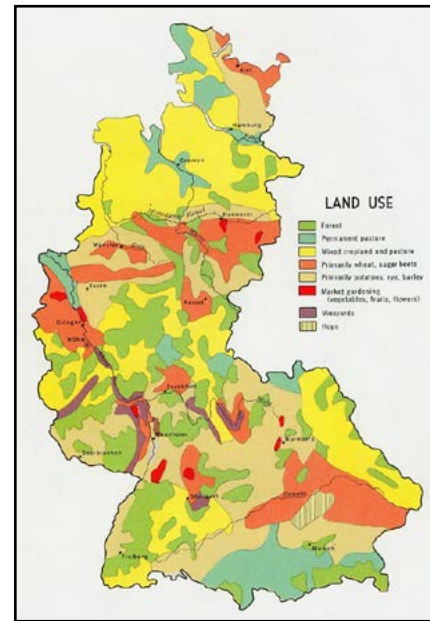


Common Eland

Plant Biodiversity

One third of Germany covered with forests

Concerning vegetation, about 30%, i.e. 11.4 million hectares, of Germany are covered with forests where 48 species of trees grow. The most common trees are the broadleaf and needle leaf varieties, including oaks, maples, and elms in the low-altitude north, and beeches, pines, and firs in the high-altitude south. Chestnut, ginkgo, walnut, cedar trees, as well as apple, plum, lemon, and other fruit-bearing trees, are also represented. If humans had not arrived in Europe 5,000 years ago, some 80% of the continent would still be covered in woods. Only a small fraction of Germany's forests consist of ancient, primeval forest that has yet to be altered or cleared by humans.



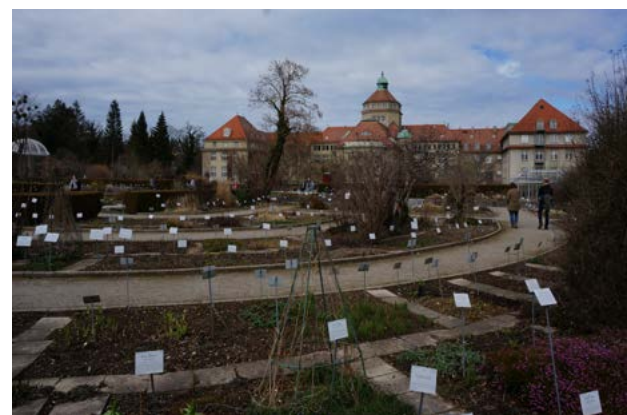
Wildflowers scattering in Germany

Germany is home to diverse vegetation that splashes the landscape in rich greens, purples, reds, and pinks. Wildflowers that appear alongside highways and across rolling meadows include bright red poppies with paper-thin petals, cheerful yellow and white daisies, bright yellow buttercups, shy purple violets, and sweet little Maiglöchen (May Bells).



Munich Botanical Garden: A platform for learning plant diversity

Covering an area of 21.20 hectares (52.4 acres), the Munich Botanical Garden in the suburb of Nymphenburg, is one of the most important botanical gardens in the world and is visited by over 350,000 visitors a year. It is home to approximately 16,000 plants.



Overview of Munich Botanical Garden

Students were divided into four groups, each equipped with a garden map and an iPad with ProScope. Students observed plants in various thematic zones, where they were properly classified into their respective taxonomic groups. In our visit to the Munich Botanical Garden, the areas of focus were tree and herbal diversity (especially of succulent plants).



Map of Munich Botanical Garden



Students are extracting useful information from the display boards.



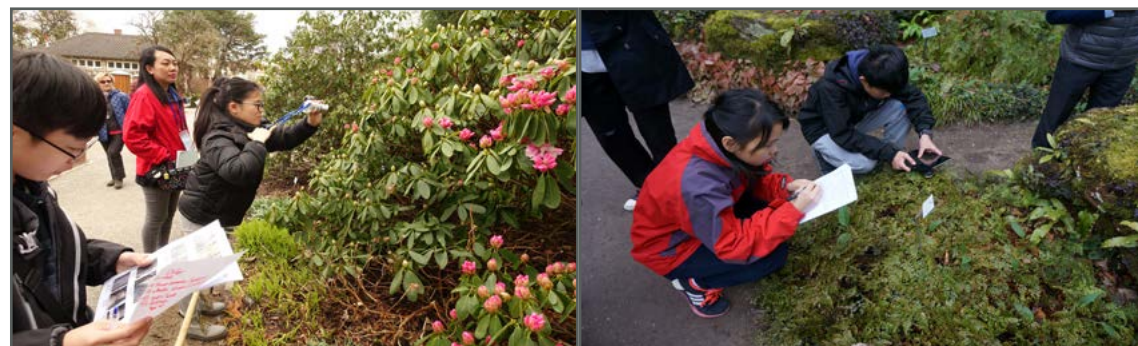
Students are comparing the morphological features of different taxonomic groups.



ProScope enables students to magnify the tiny structure on plant surfaces.

⁵ U.S. Central Intelligence Agency. Former West Germany Land Use 1972. Available: <http://www.zonu.com/fullsize-en/2009-09-18-8566/Former-West-Germany-Land-Use-1972.html> [last accessed 28 June 2016]

⁶ A Maps and Graphics Company. Germany from Space. Available: <http://www.amaps.com/spgermany.htm> [last accessed 28 June 2016]



Students are gathering the detailed information of the plants from the display board.



Different groups of students are working hard to take record for taxonomic classification.



Students are indulged themselves in the magnificent diversity of cacti in Greenhouse.



Students are taking a closer look on the 70 types of honey bees in this wooden corner.

Xerophytic plants in Greenhouse of Munich Botanical Garden

Succulents

In botany, succulent plants are plants that have some parts that are more than normally thickened and fleshy, usually to retain water in arid climates or soil conditions. The word “succulent” comes from the Latin word *sucus*, meaning juice, or sap. Succulent plants may store water in various structures, such as leaves and stems. Some definitions also include roots, so that geophytes that survive unfavorable periods by dying back to underground storage organs may be regarded as succulents.



Cactus can grow as different forms.

Cactaceae: Cactus diversity

Under classification by the International Cactaceae Systematics Group (ICSG), there are four subfamilies under cactus: Pereskioideae, Opuntioideae, Maihuenioideae and Cactoideae.

Agavoideae : Agaves – “The Century Plant”

Agaves are succulents with a large rosette of thick, fleshy leaves, each ending generally in a sharp point and having a spiny margin. The stout stem is usually short, the leaves apparently springing from the root. Various Agave species are popular ornamental plants in warmer climates. Each rosette is monocarpic and grows slowly to flower only once. During flowering, a tall stem grows from the centre of the leaf rosette and bears a large number of short, tubular flowers. After the development of fruit the original plant dies, but suckers are frequently produced from the base of the stem, which grow to become new plants.

It is a common misconception that Agaves are cacti. They are not related to cacti, nor are they closely related to Aloe whose leaves are similar in appearance.

Crassulaceae: *Sedum* sp.

Sedum is a large genus of flowering plants in the family Crassulaceae, members of which are commonly known as stonecrops. The plants have water-storing leaves. The flowers usually have five petals, seldom four or six. There are typically twice as many stamens as petals.



In the Munich Botanical Garden, we studied 57 species of succulent plants and cacti. They all came from Family Cactaceae, Crassulaceae, Asparagaceae and Bromeliaceae. The species were systematically classified into respective order, family and subfamily in the following table. Species in the same family share similarities morphologically, due to their closer phylogenetic relationships.

Such taxonomic studies enable us to relate the habitat they locate, and probably the evolutionary relationship amongst them. With precious experience to explore the magic of succulents, students knew more about their diversities and their importance in maintaining ecological stability.

Species	Major Group	Order	Family	Subfamily			
<i>Acanthocereus basantiensis</i>	Dicot	Caryophyllales	Cactaceae	Cactoideae			
<i>Calymmanthium substerile</i>							
<i>Cephalocleistocactus chrysocephalus</i>							
<i>Cleistocactus strausii</i>							
<i>Echinocactus grusonii</i>							
<i>Echinopsis candicans</i>							
<i>Echinopsis tarijensis</i>							
<i>Echinopsis terscheckii</i>							
<i>Espositoa ritteri</i>							
<i>Ferocactus glaucescens</i>							
<i>Ferocactus piliferus</i>							
<i>Ferocactus potsii</i>							
<i>Neobuxbaumia polylopha</i>							
<i>Neobuxbaumia tetetzo</i>							
<i>Weberbauerocereus fascicularis</i>							
<i>Opuntia daeryifera</i>					Opuntioideae		
<i>Opuntia ficus-indica</i>							
<i>Opuntia galapageia</i>							
<i>Opuntia rubescens</i>							
<i>Opuntia spinosior</i>							
<i>Opuntia tunicata</i>	Saxifragales	Crassulaceae	Sedoideae				
<i>Sedum clavatum</i>							
<i>Sedum compactum</i>							
<i>Sedum moranense</i>							
<i>Sedum musbaumertianum</i>							
<i>Sedum palmeri</i>							
<i>Sedum rubrotinctum</i>							
<i>Echeveria agavoides 'Corderoyi'</i>				Sempervivoideae			
<i>Echeveria skimmeri</i>							
<i>Agave bracteosa</i>				Monocot	Asparagales	Asparagaceae	Agvoideae
<i>Agave decipiens</i>							
<i>Agave filifera</i>							
<i>Agave funkiana</i>							
<i>Agave kerchovei</i>							
<i>Agave parryi</i>							
<i>Agave salmiana</i>							
<i>Agave schidigera</i>							
<i>Agave titanota</i>							
<i>Agave utahensis</i>							
<i>Beschorneria yuccoides</i>							
<i>Calibanus hookeri</i>							
<i>Yucca faxoniana</i>	Nolinoideae						
<i>Nolina longifolia</i>							
<i>Aechmea bambusoides</i>	Poales	Bromeliaceae	Bromelioideae				
<i>Billbergia mutans</i>							
<i>Fascicularia pitecainnifolia</i>							
<i>Greigia sphacelata</i>							
<i>Denterocolumbia brevifolia</i>							
<i>Denterocolumbia brevispicata</i>							
<i>Denterocolumbia lorentziana</i>							
<i>Dyckia hebdingii</i>							
<i>Dyckia maritima</i>							
<i>Dyckia rariflora</i>							
<i>Hechtia glabra</i>	Pitcairnioideae						
<i>Hechtia stenopetala</i>							
<i>Pyva coerulea</i>							
<i>Tillandsia edithae</i>		Tillandsioideae					

Succulent plants in the Greenhouse of Munich Botanical Garden

Trees and Herbs in Munich Botanical Garden



Adiantum venus



Adiantum venustum



Astibe chinensis var. davidii



Brassica oleracea



Brassica oleracea



Buddleja davidii Franchet



Buxus sempervirens



Clivia miniata



Cycas circinalis



Erica herbacea



Erica herbacea L.



Justicia nuttii



Phyllitis scolopendrium



Polystichum munitum



Rhododendron hybrid



Tulipa seedling



Tulipa sp.



Corylus colurna



Corylus colurna



Fagus sylvatica - bark



Fagus sylvatica - whole tree



Pinus leucodermis



Pinus uncinata - bark



Pinus uncinata - whole tree

Succulents and Cacti in Munich Botanical Garden



Acanthocereus baxaniensis



Aechmea bambusoides



Agave bracteosa



Agave decipiens



Agave funkiana



Agave parryi



Agave salmiana



Agave titanota



Beschorneria yuccoides



Billbergia nutans



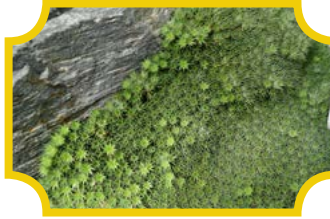
Calibanus hookeri



Calymmanthium substerile



Cleistocactus strausii



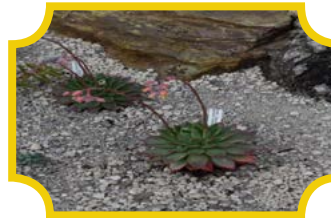
Deuterocohnia brevifolia



Deuterocohnia brevispicata



Dyckia hebdingii



Echeveria agavoides 'Corderoyi'



Echeveria skinneri



Echinocactus grusonii



Echinocactus grusonii



Echinopsis candicans



Echinopsis tarijensis



Echinopsis terscheckii



Espostoa ritteri



Fascicularia pitcairrifolia



Ferocactus glaucescens



Ferocactus glaucescens



Ferocactus piliferus



Ferocactus pottsii



Greigia sphacelata



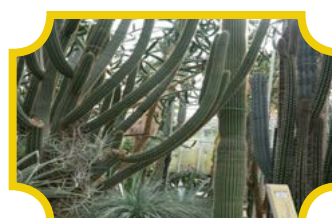
Greigia sphacelata



Hechtia glabra



Hechtia stenopetala



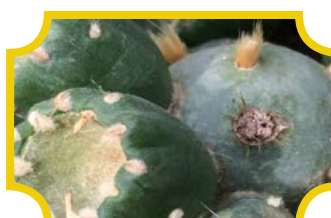
Neobuxbaumia polylopha



Neobuxbaumia tetetzo



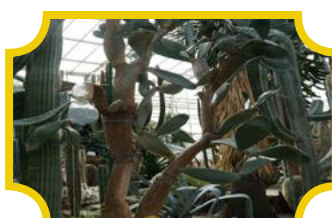
Nolina longifolia



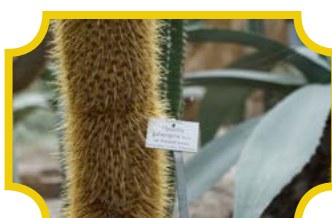
Opuntia dactylifera



Opuntia dactylifera



Opuntia ficus-indica



Opuntia galapageia



Opuntia rubescens



Opuntia spinosior - flowers



Opuntia spinosior



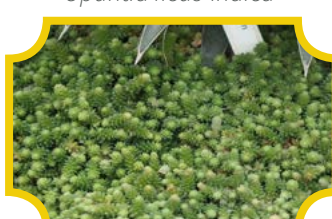
Opuntia tunicata



Puya coerulea



Sedum clavatum



Sedum compactum



Sedum moranense



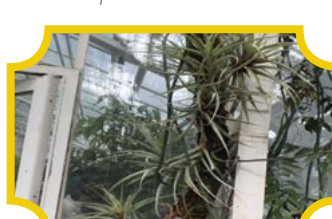
Sedum nussbaumerianum



Sedum palmeri



Sedum rubrotinctum



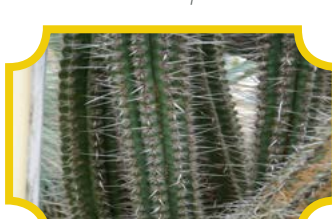
Tillandsia edithae



Tillandsia edithae



Tillandsia edithae



Weberbauerocereus fascicularis

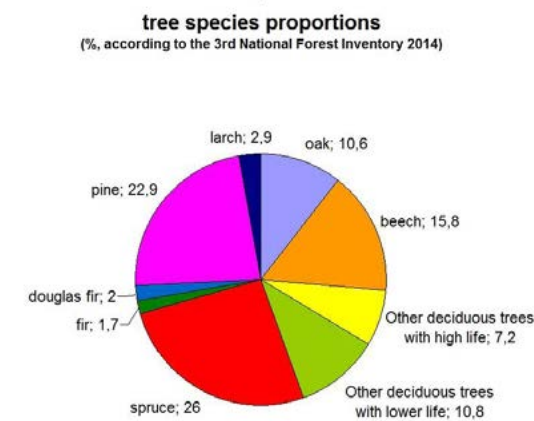


Yucca faxoniana

Trees of Germany

Tree species proportions in Germany

German forests are today composed of 60% coniferous forests and around 40% deciduous forests. Approximately 73% of German forests nowadays consist of mixed stands. Spruce accounts for the largest share among tree species (28%), followed by pine (23%), beech trees (15%) and oak trees (10%). The tree species proportions vary and depend on the specific natural features and site conditions, as well as on different historic developments. Large-scale forest zones can be found in Germany: pine trees abound in the north of Germany, deciduous trees prevail in the lower mountain ranges and coastal areas, and southern Germany is rich in spruce trees.



Trees not only shape Germany's landscape, but also play an important role in its cultural history. Our students observed the barks and morphology of various trees. Some representative species were listed and detailed as follows:

European beech (*Fagus sylvatica*)

The common European beech (*Fagus sylvatica*) is one of the most common hardwood trees in north central Europe. Beech grows on a wide range of soil types, acidic or basic, provided they are not waterlogged. The tree canopy casts dense shade, and carpets the ground thickly with leaf litter. There is some research suggesting that early agricultural patterns supported the spread of beech in continental Europe. Research has linked the establishment of beech stands in Scandinavia and Germany with cultivation and fire disturbance, i.e. early agricultural practices. In 2011, a committee of experts from the United Nations Educational, Scientific and Cultural Organization (UNESCO) agreed to declare five German beech forests as World Heritage Sites, making endangered species inhabiting there well protected by law.



European beech in Munich Botanical Garden

Baum-Hasel (*Corylus colurna*)

Baum-Hasel (*Corylus colurna*) is a deciduous tree native to southeast Europe and southwest Asia. It is the largest species of hazel. The crown is slender and conical in young trees, becoming broader with age. The bark is pale grey-buff, with a thick and , corky texture. It is very tolerant of difficult growing conditions in urban situations, which has increased its popularity in civic planting schemes in recent decades. Baum-Hasel makes a wonderful shade tree since it produces a very dense shade, and its narrow crown and ability to withstand air-pollution make it well suited for use as a roadside tree in urban areas.



Baum-Hasel in Munich Botanical Garden

Mountain Pine (*Pinus uncinata*)

The main value of Mountain Pine (*Pinus uncinata*) is ecological and acts as an ornamental tree. The wood is used as fuel and is suitable for light construction. Some of the wood is excellent for special uses like turnery, woodware and making musical instruments; this is due to its relative density and hardness. It is uncommon in cultivation and usually restricted to local parks, botanic gardens and arboreta.



Mountain Pine in Munich Botanical Garden

London Plane Trees (*Platanus × acerifolia*)

London Plane Tree (*Platanus × acerifolia*) is a tree in the genus *Platanus*. It is usually thought to be a hybrid of *Platanus orientalis* (oriental plane) and *Platanus occidentalis* (American sycamore). The London plane is very tolerant of atmospheric pollution and root compaction, and for this reason it is a popular urban roadside tree. It is now extensively cultivated in most temperate latitudes as an ornamental and parkland tree, and is a commonly planted tree in cities throughout the temperate regions of the world. The tree is fairly wind-resistant. However, it causes a number of problems in urban use, because of the short, stiff hairs shed by the young leaves and seed dispersal. Both of these are irritants which, if breathed in, exacerbate breathing difficulties for people with asthma. The large leaves also create a disposal problem in cities. These leaves are tough and sometimes take more than a year to decompose.



Plane trees in Berlin Zoological Garden



Pruned plane trees in Brudl's Terrace, Dresden



Plane trees in Brudl's Terrace (Summer)

Lawson cypress (*Chamaecyparis lawsoniana*)

Lawson cypress (*Chamaecyparis lawsoniana*) is a large evergreen tree which in its mature state, may reach 60 m or above in height. The trunk can be 1.2–2 m in diameter. The foliage is feathery, arrayed in flat sprays, and is usually somewhat glaucous (i.e. blue-green) in colour.

The wood is light yet has great strength and is rot-resistant. It is particularly highly valued in East Asia, with large amounts being exported to Japan where it is in high demand for making coffins, shrines and temple construction. Its lumber is also known for its highly fragrant ginger aroma. Due to the straightness of its grain, it is also one of the preferred woods for the manufacture of arrow shafts. It is also considered an acceptable, though not ideal, wood for the construction of aircraft. Its fine grain, good strength and tonal quality are highly regarded for soundboards in guitar construction.



Lawson cypress in Munich Botanical Garden

Scot Pine (*Pinus sylvestris*)

Scots Pine (*Pinus sylvestris*) is the only pine native to northern Europe, forming either pure forests or existing alongside Norway spruce, common juniper, silver birch, European rowan, Eurasian aspen and other hardwood species. Scots pine is an important tree in forestry. The wood is used for pulp and sawn timber products.



Scot Pine inside Berlin Zoological Garden

Linden Trees (*Tilia platyphyllos*)

Linden tree (*Tilia platyphyllos*) is a species of flowering plant in the family Malvaceae. It is a deciduous tree, native to much of Europe. Linden flowers are used as medication for: colds, cough, fever, infections, inflammation, high blood pressure, headache (particularly migraine), as a diuretic (increases urine production), antispasmodic (reduces smooth muscle spasm along the digestive tract), and as a sedative. The flowers were added to baths to quell hysteria, and brewed as a tea to relieve anxiety-related indigestion, irregular heartbeat, and vomiting. The leaves are used to promote sweating to reduce fevers. The wood is used for liver and gallbladder disorders and cellulitis (inflammation of the skin and surrounding soft tissue). The wood can also be burned into charcoal and ingested to treat intestinal disorders, or used topically to treat edema or infections such as cellulitis or ulcers of the lower leg.

History of Unter den Linden:

Unter den Linden (“under the linden trees”) is a boulevard in the Mitte district of Berlin, the capital of Germany. Unter den Linden, which sits at the heart of the historic section of Berlin, was developed from a bridle path laid out by Elector John George of Brandenburg in the 16th century to reach his hunting grounds in the Tiergarten. It was replaced by a boulevard of linden trees planted in 1647, extending from the city palace to the gates of the city, by order of the “Great Elector” Frederick William. In the course of the building of the Nord-Süd-Tunnel for the Berlin S-Bahn in 1934–35, most of the linden trees were cut down and, during the last days of Second World War, the remaining trees were destroyed or cut down for firewood. The present-day linden trees were replanted in the 1950s.



Linden Trees along the Unter den Linden



Linden Trees inside the Berlin Zoo Zoological Garden



Linden Trees along the Unter den Linden

Threat encountered:

Like other native German species, lindens are having increasing problems coping with hot, dry summers and bitterly cold winters, as well as pollution from cars and the large amounts of road-salt that end up in the soil. The trees in the city are under stress.

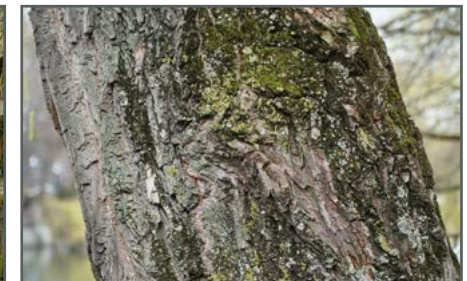


Heavy traffic along the Unter den Linden

Willow Tree (*Salix alba*)

Willow tree (*Salix sp.*) has abundant watery bark sap. The roots are remarkable for their toughness, size, and tenacity for life. Its roots readily grow from aerial parts of the plant.

Willows are used as food plants by the larvae of some Lepidoptera species, such as the mourning cloak butterfly. Ants, such as wood ants, are common on willows inhabited by aphids, coming to collect aphid honeydew, as sometimes do wasps. Willow roots spread widely and are very aggressive in seeking out moisture; for this reason, they can become problematic when planted in residential areas.



Norway Spruce (*Picea abies*)

Picea abies is a large, fast-growing evergreen coniferous tree growing 35–55 m tall. The shoots are orange-brown and glabrous (hairless). The leaves are needle-like, quadrangular in cross-section and dark green on all four sides with inconspicuous stomatal lines. The cones have bluntly to sharply triangular-pointed scale tips with green or reddish colour.



Interesting facts:

Evergreen trees have traditionally been used to celebrate winter festivals (pagan and Christian) for thousands of years. Christians use them as a sign of everlasting life with God. The first Christmas trees came to Britain in the 1830s. They became very popular in 1841, when Prince Albert (Queen Victoria's German husband) brought a tree back from Germany and had it set up in Windsor Castle. In 1848, a drawing of "The Queen's Christmas tree at Windsor Castle" was published in the Illustrated London News and the tradition of decorating a tree at Christmas time became fashionable.



Threat:

Today, *Picea abies* comprises 35% of the tree cover in Germany, and most of that is in managed forests. It is an irony that over the last fifty years forest management in Germany has increased forest size considerably, but the air pollution there is still so extreme. The reason is that pollution gets blown there from other countries. For this reason the forests are very unhealthy and the yield from that acreage is decreasing. *Picea abies* is acutely vulnerable to problems arising from pollution, especially acid rain.



Norway Spruce in Dachau Concentration Camp

Silver Birch (*Betula pendula*)



Silver Birch in Dachau Concentration Camp

Betula pendula, commonly known as silver birch or warty birch, is a species of tree in the family Betulaceae. It is native to Europe and parts of Asia, although in southern Europe it is only found at higher altitudes. Its range extends into Siberia, China and southwest Asia in the mountains of northern Turkey, the Caucasus and northern Iran.

The silver birch is a medium-sized deciduous tree that owes its common name to the white peeling bark on the trunk. The twigs are slender and often pendulous and the leaves are roughly triangular with doubly serrated margins and turn yellow in autumn before they fall. The flowers are catkins and the light, winged seed is widely scattered by the wind. The silver birch is a hardy tree, a pioneer species, and one of the first trees to appear on bare or fire-swept land. Many species of birds and animals are found in birch woodland. The tree also supports a wide range of insects and the light shade it casts allows shrubby and other plants to grow beneath its canopy. Various parts of the tree are used in traditional medicine and the bark contains triterpenes which have been shown to have medicinal properties.



Poplar Tree (*Populus alba*)

The bark of young trees (*Populus sp.*) is smooth, white to greenish or dark grey, often with conspicuous lenticels. The shoots are stout, with the terminal buds present. The leaves are spirally arranged and with a long laterally flattened petiole, so that breezes easily cause the leaves to wobble back and forth, giving the whole tree a "twinkling" appearance in a breeze. The leaves often turn bright gold to yellow before they fall during autumn. The flowers are mostly dioecious (rarely monoecious) and appear in early spring before the leaves. They are borne in long, drooping, sessile or pedunculate catkins produced from buds formed in the axils of the leaves of the previous year.



Poplar in Dachau Concentration Camp

History:

The trees along this main pathway at the centre of the camp were planted by the prisoners themselves in an attempt by the Nazis to beautify the camp prior to a human rights inspection. The original trees, planted by the prisoners in 1938, were removed in 1948 when Dachau was turned into a refugee camp; the present trees were planted in the 1980s and some have been replaced since then. In the September 2006 issue of Science Magazine, the Joint Genome Institute announced that the Western Balsam Poplar (*P. trichocarpa*) was the first tree whose full DNA code had been unveiled by DNA sequencing.

Oak (*Quercus robur*)

Oaks have spirally arranged leaves, with lobate margins in many species; some have serrated leaves or entire leaves with smooth margins. Many deciduous species are marcescent, not dropping dead leaves until spring. In spring, a single oak tree produces both male flowers (in the form of catkins) and small female flowers. The fruit is a nut called an acorn, borne in a cup-like structure known as a cupule. Many species of oaks are under threat of extinction in the wild, largely due to land use changes, livestock grazing and unsustainable harvesting.

History:

Visitors to the Dachau concentration camp find that the most prominent spot in the site is occupied by The Church of the Mortal Agony of Christ. The Church, designed by German architect Josef Wiedemann, stands on a circular island of grass surrounded by a ring of oak trees (*Quercus robur*).



A ring of oak trees surrounding The Church of Mortal Agony of Christ



Post-Trip Activities: Plant Biodiversity in CFSS

Our students compared the biodiversity of succulent plants and cacti in the Munich Botanical Garden and in our school campus. Our school is indeed a treasure of biodiversity, housing 245 species of succulents and cacti in the Greenhouse and on the Main Roof. Some of the species could also be found in Munich Botanical Garden.



Dozens of cycads species can be found in the Creative Garden on Main Roof of our school



Students are comparing the diversity of Agaves cultivated in our campus and those in Munich Botanical Garden



Our School Principal Mr. Au is explaining the structural adaptation of succulents and cacti. He is asking students to compare the morphological and species diversity with those in Germany.

Management



Management is the key to success of an organization.

Introduction

Germany's companies are renowned for their management style. Before the trip, we were given a brief introduction on Germany's brands. There are many famous brands originated from Germany including Adidas, Audi, BMW, Siemens, Staedtler and Zeiss. It is our honour to have an opportunity to visit Audi, Munich Re Group, Roland Berger and LSG Sky Chefs.



Munich Re Group

Insurance business is a growing industry in the world, but this is our first time to learn about the re-insurance business. Re-insurance provides insurance for the insurance companies. This is a kind of risk management strategy for the insurance companies. It is very rewarding for us to have a chance to visit one of the famous companies of the re-insurance industry and our honour to meet with Mr. Christoph Stuber and Dr. rer. pol. Ludger Arnoldussen. With their clear and concise introduction, our horizons were broadened greatly.



Our students are listening to Dr Arnoldussen's introduction of Munich Re Group.

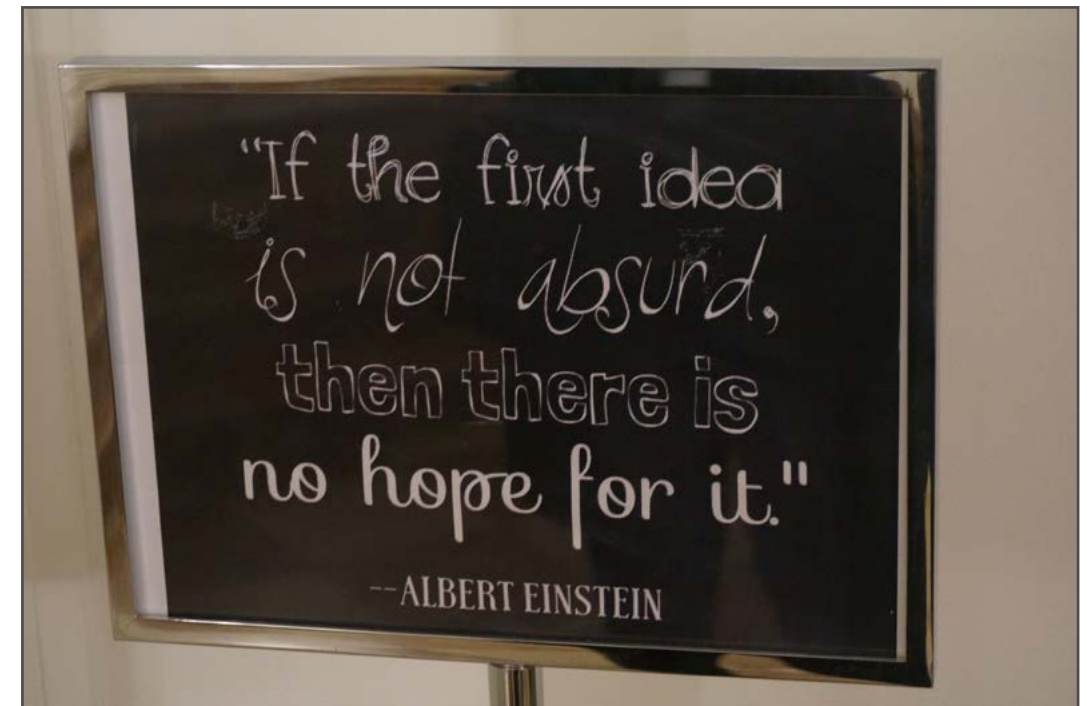


Our alumna wishes to know more about the re-insurance industry.

Munich Re Group is a corporation in re-insurance business. The Group was ranked the first company in the area of re-insurance worldwide in 2015. Before the visit, we had imagined that the headquarters of the corporation would be situated in a grand, tall and modern building. Instead, the headquarters of the company is located in a historic heritage building.



Never judge a company by the look of its building. The headquarters building of Munich Re Group is situated in a building with a classic outlook while innovative business practices are done inside this heritage building.



A quotation from Einstein is found inside the building. This quotation indicates that the Group is willing to be innovative in its products and services.



Business is done in this conference room with classical style.

Different departments are located in various buildings around the headquarters. Since Germany has a cold winter, it is likely to be inconvenient for staff to walk from one building to another in the open. To tackle this problem, the Group has built tunnels inside the buildings to connect most of the buildings around the headquarters. Although the Group has buildings of classic style, the tunnels are futuristic. It is an integration of classic and modern styles.



Tunnels are designed in a fantastic style.

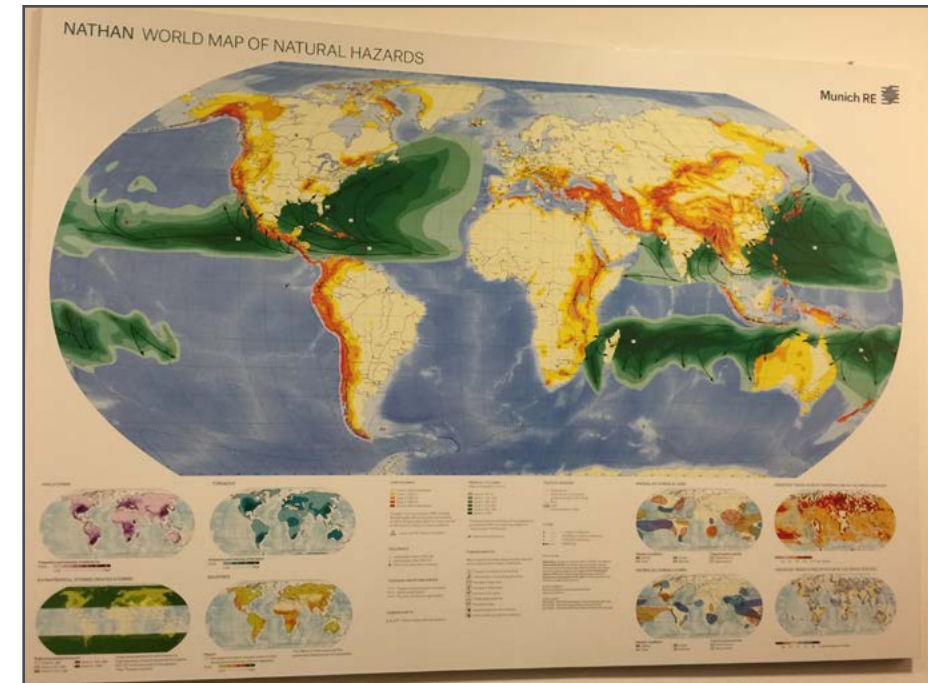


We are amazed by the design of the tunnels.



Walking along the tunnels, we have the experience of entering a spacecraft.

The Re-insurance business involves a lot of natural hazards around the world. In recent years, there have been several extreme weather events. This is why the subject of sustainable development is a vital issue of this company. This view about sustainable development is consistent with our school's view.

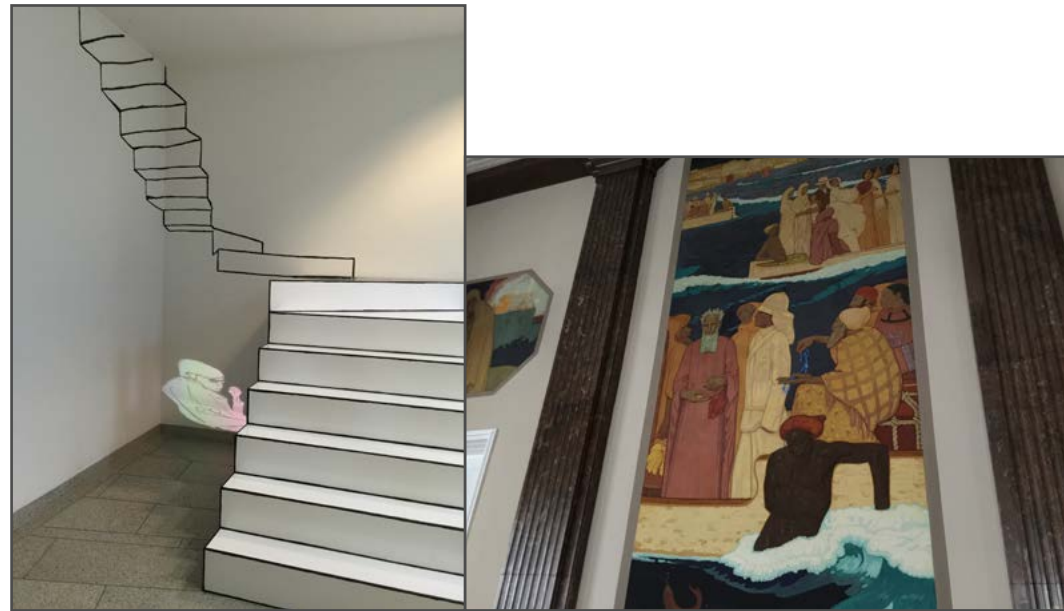


The map indicates the natural hazards in the world.

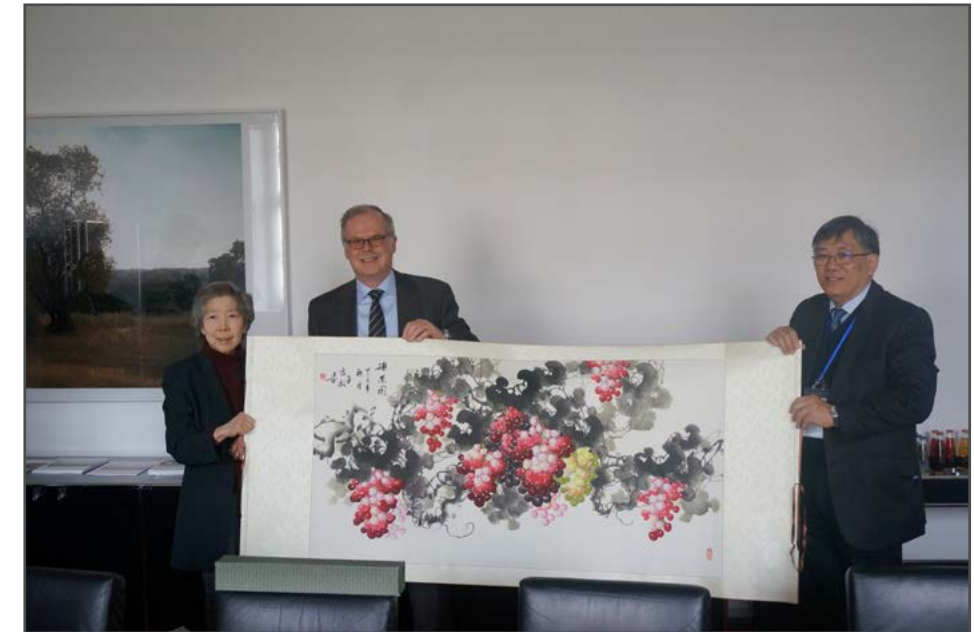


Mr. Stuber is explaining the effects of extreme weather on humans.

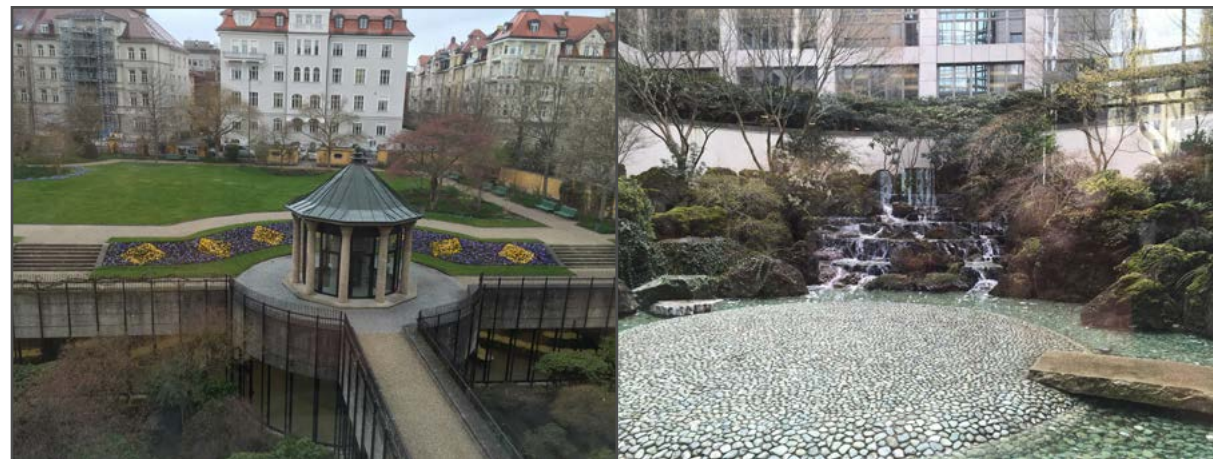
Besides the modern and classical design of the headquarters, the Group provides a comfortable working environment for all staff. A well maintained garden is provided so that the staff may have a leisure chat in the garden with their colleagues during the break. The Group also runs a canteen serving various kinds of food. Moreover, artwork is placed in various places inside and outside the headquarters office.



Art works are displayed in the headquarters building.



We show our great appreciation to Dr. Arnoldussen for his help in providing us with an opportunity to visit Munich Re Group.



A user-friendly environment is provided in an attempt to raise productivity.



Group photo in the headquarters building



The large sculpture "Walking Man" is the icon of the headquarters building. This artwork represents "the will to set out in search of new horizons".

Roland Berger

Roland Berger is the only leading global consultancy with German heritage and European origin. Roland Berger advises major international industry and service companies as well as public institutions.



Students learn how a consultant company is operated.



Representatives of Roland Berger welcomes our students and teachers.

Our students visited the headquarters of Roland Berger in Munich. Mr. Ralph Büchele of Roland Berger explained to our students what the company does. Knowing that our school emphasizes education on sustainable development, they used renewable energy as an example to show how Roland Berger works.



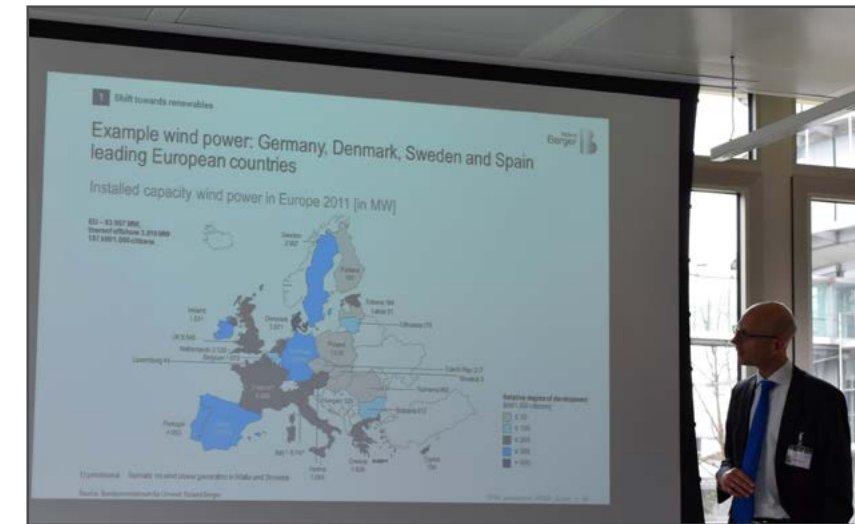
Mr. Ralph Büchele explains the history and company structure to our students.



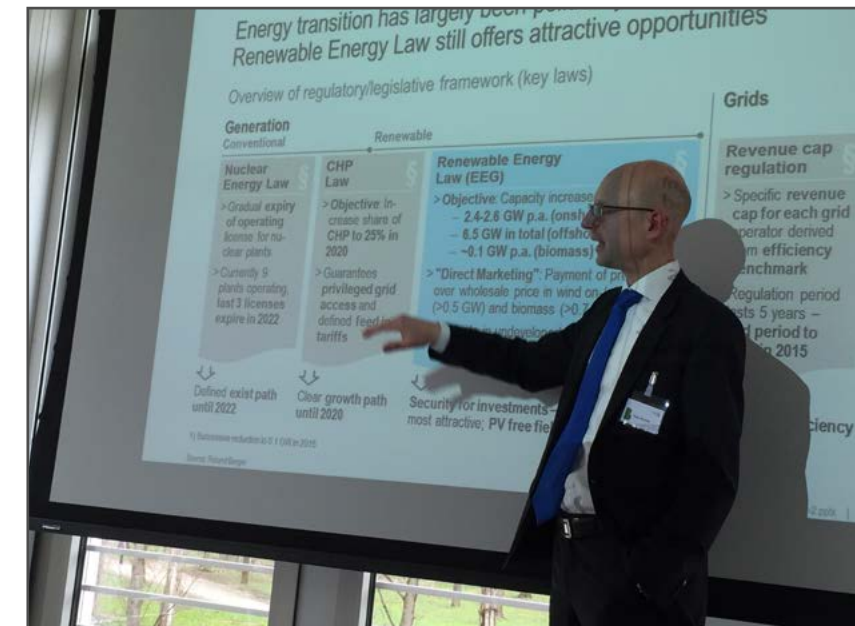
The major clients of Roland Berger are of various societal groups

The service of Roland Berger covers the entire range of management consultation from strategic advice to successful implementation including new leadership and business models, innovative processes and services, M&A, private equity and restructuring and management support on large infrastructure projects.

Outstanding management consultants are more than just brilliant analysts and strategists. Above all, they are strong and creative experts from a variety of backgrounds. Everyone at Roland Berger is committed to the three core values: excellence, entrepreneurship and empathy.



Wind power is one of the projects in Germany.



Environmental policies have to follow legislative framework.

Our students attended the practice session after the introduction by Mr. Ralph Büchele. They were asked to finish a task which is a simplified version of a consultant project. In order to experience how a consultant company works, students were divided into 3 groups and each group was guided by a consultant of Roland Berger.



Students look out a solution to the given problem.

After the preparation, our students presented their solution to the problems and received feedback from the experts. In this activity, our students gained a better understanding of how a consultant company operates and knowledge about renewable energy.



Students are presenting their ideas.

LSG Sky Chefs

When you are travelling around the world by plane, it is unavoidable to have meal on a plane. Have you ever been curious about how these meals are prepared? Our last stop in Germany was LSG Sky Chefs, which provides in-flight meals.



Our Principal Mr. Au is presenting a souvenir to Mr. Ralph Büchele of Roland Berger.



A group photo with the Roland Berger consultant



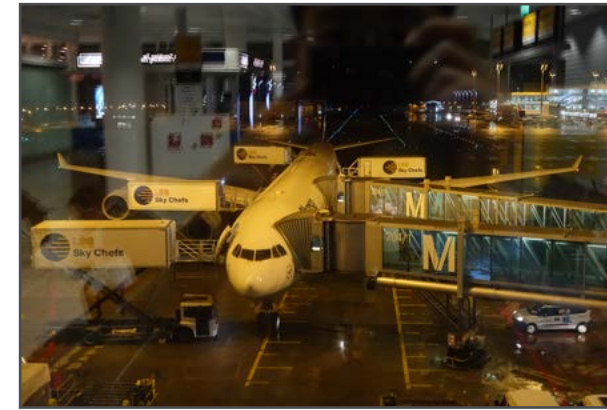
This production centre of LSG Sky Chefs at Munich Airport

Being a food producer, hygiene is the most important issue for the company. We were allowed to visit the production lines, undergoing a rigorous security check before entering the plant. All of us were required to wear laboratory gowns and surgical caps. In addition, we were not allowed to take photos inside the plant. All of these measures are to prevent outsiders, like us, from bringing dirt and bacteria into the plant.

It was very impressive to see the production line which is very systematic and well-organized. Each employee was assigned a specific task in preparing the meal. Trolleys were transferred by conveyer belt over our heads. Besides the in-flight meals, the plant is also responsible for preparing other items such as blankets, headphones and socks.



1



The meals and other logistics are transferred from the plant to the plane by lorries.



2



4



3



A group photo is taken outside the production centre.

Etiquette



Etiquette is something that
we cannot learn in school.

Etiquette

We visited many organizations before and during the trip in Germany. Before the trip, we had chance to meet Mr. Song Zhe, the Commissioner of the Ministry of Foreign Affairs of the People's Republic of China in HKSAR. While in Germany, we visited Mr. Li Xiaosi, the Envoy of the Embassy of the People's Republic of China in Berlin, and Ms. Mao Jingqiu, the Consul General in the Consulate General of PRC in Munich.

Visit to the Office of the Commissioner of the Ministry of Foreign Affairs of the People's Republic of China in Hong Kong

A visit to the Office of the Commissioner of the Ministry of Foreign Affairs was arranged before the trip. After a warm welcoming, Mr. Song Zhe, the commissioner of the office, gave a brief account on the history of Germany, the relationship between Germany and China, and challenges faced by Germany nowadays. He emphasized that the German government has paid a lot of effort on the advanced technology sectors and management in German companies. He also reminded us that the most important virtues of communicating and exchanging ideas with others are mutual-understanding, practicality and equality. Students were all inspired by Mr Song's speech and promised to be well-prepared for the journey.



Mr. Song is greeting our students and teachers.



Our student is asking Mr. Song questions.

Visit to the Embassy of the People's Republic of China in Berlin

The Embassy of the People's Republic of China in Berlin was our first place to visit after landing in Berlin. We were treated with refreshment and had causal talks with the Envoy, Mr. Li Xiaosi. After the welcoming speech, he then introduced the recent progress of the "Belt and Road Initiative" in Germany and Europe. More railways and infrastructures will be constructed along trading routes between Europe and Far-East. Mr Li also pointed out that Hong Kong, as an internationally renowned financial hub, can participate in these development projects by acting as a platform for attracting overseas capital and providing legal support to these projects. After that, Mr Li shared his own experience as a diplomat in Berlin. Our students gained a lot of insights from his talk.



Our students are given a valuable opportunity to meet with Mr. Li, the Envoy of the Embassy of the People's Republic of China in Berlin.

Visit to the Consulate General of the People's Republic of China in Munich

It is our honour to visit the Consulate General of China in Munich. Ms. Mao Jingqiu mentioned the difference between the Embassy and Consulate General. Unlike the Embassy of the PRC in Berlin, the Consulate General focuses on the communication and exchange in terms of cultural and economic aspects. As automobile industry is one of the major areas of focus in Germany, Ms. Mao has participated in a lot of commercial events related to the industry in Bavaria to ensure every possibility of cooperation between China and Germany. In the visit, we learnt the work of the Consulate General. We all appreciated the warm welcome from Ms. Mao.



Mr. Li is sharing his experience with our students.



Mr. Li is answering our students' questions.



Our Principal is presenting souvenirs to Ms Mao.



Ms Mao is introducing the work of Consulate General in Munich.



It is our honour to have group photo with the representatives of China in Munich.

Reflection



In the seven days in Germany, the participants learnt a lot, especially the history and culture, advanced technology and the environmental situations in this country. Also, they observed how the Germans really behave and how companies are managed. It is an unforgettable experience to every participant.

Hui Tsz Yau



Germans are environmentally friendly. You rarely see people riding bike to school or work in Hong Kong. Yet in Germany, riding bike is common and I even saw older people roller skating on the street.

I never expected that these people with their minds so filled with serious and productive thoughts could be so relaxed and open to conversation. This is something that the pre-trip workshops did not cover.

Mak Chun Yin



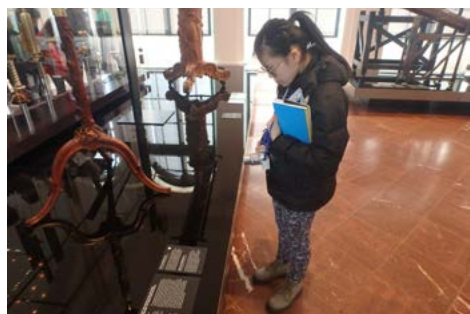
Yeung Katie



I think the factory did a very good job of handling the scrap metal leftover from the production process to be collected and recycled. This sets a good example for other factories to follow in order to protect the environment.

What impressed me the most was how the Germans admit the fact that Hitler had killed so many Jews during the genocide. Since the end of the Second World War, Germany has been facing up to their history, building memorial sites and telling later generations that no one should ever forget what they did during the war.

Cheng Sum Yi, Natalie



Pretending to be a Jew inside the concentration camp just filled me with fear from the moment in the old train station to the gas chamber. Even though the camp is now not in operation and only open to visit, its atmosphere is still deep and lonesome.

Wu Tsz Yeung



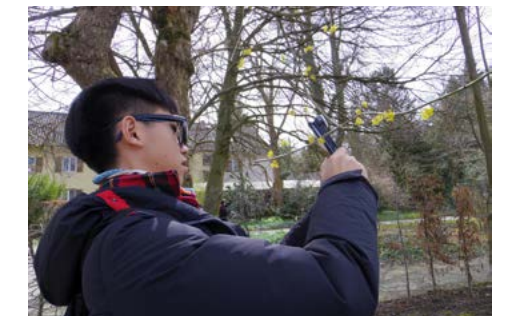
German workers are perfectly consumed in their work and seldom get distracted by other things. After going around the production plant, I noticed that you seldom see a worker sitting around chatting or idle when it's work time. The people get focussed during working time but also enjoy playing in their free time, so they have a great work-life balance, which is why they are so productive.

Although Germans are not really open to new technologies, so not every one of them is holding a smartphone as Hong Kong people usually do, they do fully utilize their talents and technology to form their "Industry 4.0".

Wai Rachel



Lam Pak Hang



When I was visiting the camp, I found out how the Jews entertained themselves and it left a deep impression on me. They wrote songs because it was the only entertainment they were allowed to do. This made me start to admire their determination, even when they were in a very bad environment ,they still found something to make themselves happy.

Cheng Tsz Tung



I was most impressed by the biodiversity in Germany. The greening in Germany is a lot better than in Hong Kong. In Germany you see plenty of trees along the roads and around the city. However in Hong Kong, the number of trees along the roads is a lot less.

Zou Zhao Ning



Most Germans are helpful and friendly. When we did survey on the street, most of them answered our questions, even if they didn't speak fluent English. In Hong Kong, people are less willing to participate in a street survey.

Dow Cheuk Wing



Chan Wing Shan Sally

I was a graduate student of CFSS in the Year 2005. I am now studying in the southern part of Germany for a Masters of Biomedical Engineering. It was my pleasure to participate in the Germany Education Tour held by CFSS.

The education tour was extremely informative and I am very grateful that I had the opportunity to have these experiences. I have had many interesting insights into various areas during the trip. The most valuable experience that I had throughout the trip was the visit to the production lines at the Audi plant because it is not open to the general public. In the assembly process, I learned that 86% of the work is performed by the programmed-robotics. The whole process is very precise and efficient with all the detailed measurements and controls programmed into the robotic arms. Germany is proud of its automotive industry thanks to the sizable investment in research and development, which positions it at the top of tier in Europe. From the design, manufacturing, product development, marketing to selling, the auto sector contributed to around 20% of the total German industry revenue in the Year 2014. I am very grateful for having this wonderful opportunity to visit the production site and having a guided-tour around the Audi Museum.



Different people have different points of view in the interpretation of things. Through discussions one can learn more than expected. The entire education tour was very well organized and prepared, and all destinations had specific topics for us to focus on. For example, we were studying biodiversity in the Botanical Garden and Zoological Garden, and advanced technology in the museums. Throughout the trip, we were divided into groups with teachers and students, which enhanced discussions and the learning process. I studied the animals with the same Family and Genus but different Species and enjoyed it very much.

Another highlight of the experience for me was the visit to the Embassy of the PRC in Berlin and the Consulate-General of PRC in Munich. There was a chance for me to have discussion about topics relating to the relationship and future cooperation between China and Germany. A number of exchanges in studies, automobile industry developments are going on now, I believe cultural and technology exchanges between countries are very important in the long term.

Company visits to Munich Re Group, Roland Berger and LSG Sky Chefs provided me with the opportunity to get a better understanding of the operational processes of these German companies. The architecture of the headquarters building in Munich Re was very impressive with a garden outside and many artistic decorations inside. It gave me the feeling of royalty from historic times. There is a 17-meter tall statue named "Walking Man" outside the building. Built in September 1995, the statue represents that the company is moving forward all the time. This is a symbol of the company, which attracts people's attention easily.

The visit to LSG Sky Chefs was very interesting for me because I love airplanes and I got the chance to see how Lufthansa Airlines prepares meals for its passengers. The whole process is incredibly efficient and is divided into different sections for the preparation of each type of meal. I was curious about how the company could manage to ensure the stock of meal boxes on the airplane would not run out. They explained that it was from past experience. They looked at the extreme cases of passengers on different flight destinations and in different seasons and analysed the statistics so that they could estimate the amount of food and ingredients. What I like about this company is that they have a very good management system and it is a very well organized company.

I would like to express special thank to Dr. Wu for the full sponsorship of this trip, who provided international contacts have provided us with some very unique experiences which have made a big difference of this tour when compared with education tours I have had before. After two and a half years of living in Germany, I am amazed by the politeness of the Germans. They follow rules very strictly, and care very much about the environment. Having a sharing with other students in the tour I am sure that they have all gained a positive impression about the German culture. It has been my honor to join the trip and share my experiences with all of you.

Mein Name ist Sally Chan, ich bin Absolventin der CFSS im Jahrgang 2005 und zur Zeit in Süddeutschland, um mein Studium der Biomedizintechnik mit einem Masterabschluss zu beenden.

Ich habe an der Bildungsreise der CFSS durch Deutschland teilgenommen. Die Bildungsreise war extrem lehrreich und ich bin sehr dankbar für diese Erfahrungen. Die Reise gewährte mir viele interessante Einblicke in diverse Bereiche. Die wertvollste Erfahrung, die ich während der Reise machen konnte, war der Besuch der Montagehalle im Audi-Werk, weil diese der Öffentlichkeit nicht zugänglich ist. Der Montageprozess, das sind 86% der Arbeitsbelastung, wird durch programmierte Roboter vorgenommen. Der gesamte Prozess ist sehr präzise und effizient und wird durch detaillierte Messungen und Kontrollen im Arbeitsbereich der Roboter überwacht. Deutschland ist sehr stolz auf seine Automobilindustrie und dank der großen Investitionen in Forschung und Entwicklung nimmt Deutschland in diesem Bereich die Führungsrolle in Europa ein. In Bezug auf Konstruktion, Fertigung, Produktentwicklung, Marketing und Verkauf betrug der Umsatz im Automobilsektor rund 20% der gesamten deutschen Industrieleistung im Jahr 2014. Ich bin sehr glücklich, dass ich diese einmalige Chance hatte, die Produktionsstätte gesehen und eine geführte Tour durch die Geschichte im Audi-Museum erlebt zu haben.

Unterschiedliche Menschen haben unterschiedliche Blickwinkel bei der Interpretation von Dingen. Daher war es für mich immer sehr lehrreich, sich mit vielen Menschen zu unterhalten. Die gesamte Bildungsreise war sehr gut organisiert und strukturiert. An festgelegten Kontrollpunkten bekamen wir bestimmte Themen zugeteilt. Beispielsweise haben wir uns mit der biologischen Vielfalt im Botanischen Garten und im Zoo oder mit Hochtechnologie im Museum beschäftigt. Während des gesamten Prozesses wurden wir in Gruppen aus einer Mischung von Lehrern und Schülern aufgeteilt, sodass wir besser diskutieren und lernen konnten. Ich habe mich mit Tieren gleicher Familien und gleicher Gattungen beschäftigt. Diese Tiere unterteilen sich in unterschiedliche Arten mit unterschiedlichen Details. Diese Arbeit hat mir sehr viel Spaß gemacht.

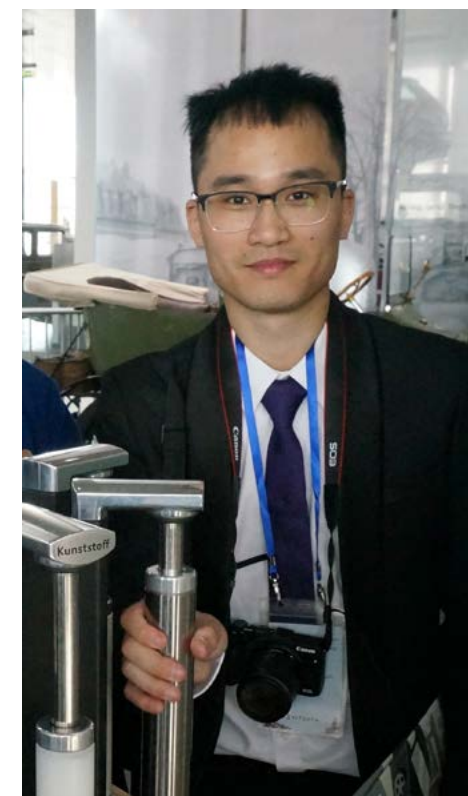
Ein weiterer Höhepunkt war für mich der Besuch der Botschaft und des Generalkonsulates der Volksrepublik China in Berlin und der Besuch des Generalkonsulates der Volksrepublik China in München. Wir hatten die Gelegenheit zu sehr engen Gesprächen über die Beziehungen zwischen China und Deutschland und weiterer künftiger Zusammenarbeit. Derzeit gibt es eine Vielzahl von Austauschprogrammen für Studien und für Entwicklungen in der Automobilindustrie. Ich glaube, dass sowohl der kulturelle als auch der technologische Austausch zwischen beiden Ländern für eine langfristige positive Entwicklung sehr wichtig ist.

Firmenbesuche bei der Münchner Rück, Roland Berger und LSG Sky Chefs gaben mir die Möglichkeit, Einblicke in die Arbeitsweise von deutschen Firmen zu bekommen. Die Architektur der Firmenzentrale der Münchener Rück war sehr eindrucksvoll: Mit einem großen Gartenareal und einer großen Kunstsammlung im Innenbereich fühlte man das königliche Ambiente und spürte den Charme der alten herrschaftlichen Zeiten. Der „Walking Man“, eine 17m große Statue, steht seit September 1995 an der Leopoldstraße in München vor dem Eingangsbereich der Versicherung, die das Werk im Rahmen ihrer Kunstförderung finanzierte. Sie repräsentiert, auch im Sinne der Münchener Rück, Aufbruchswillen und Entdeckergeist - den Willen zum Fortschritt im ureigensten Sinn.

Auch der Besuch der LSG Sky Chefs war hochinteressant, da ich mich sehr für Flugzeuge interessiere. Ich hatte die Gelegenheit, die Zubereitung für das Essen in der Luft für die Lufthansa Fluggesellschaft zu begleiten. Der gesamte Prozess ist sehr effizient, einzelne Abteilungen bereiten verschiedene Speisen in verschiedenen Schritten zu, so können die Mahlzeiten verschiedensten Anforderungen im Bezug auf Zubereitung und Zutaten gerecht werden. Ich war erstaunt, wie die Firma sicherstellt, dass der Vorrat an verschiedenen Menüs nicht zu knapp wird. Aus meiner Erfahrung heraus gibt es immer eine sehr große Auswahl, aber auch eine sehr differenzierte Nachfrage an Gerichten. Vermutlich werden alle Bestellungen über einen gewissen Zeitraum analysiert und statistisch ausgewertet, um zu errechnen, was wann auf welchem Flug benötigt wird. An dieser Firma hat mich am meisten fasziniert, dass sie über ein sehr gutes Management verfügt und die Arbeitsabläufe sehr gut analysiert und ausgewertet werden.

Mein besonderer Dank geht an Frau Dr. Wu für die Vollförderung der ganzen Reise. Mit ihrem weltweiten persönlichen Netzwerk und Ihren Beziehungen ermöglichte Sie uns die unterschiedlichsten Aktivitäten und Besuche, die sich von meinen vorherigen Bildungseisen deutlich abgehoben haben. Ich lebe nun seit zweieinhalb Jahren in Deutschland und bin immer wieder beeindruckt, wie höflich die Deutschen sind. Sie sind sehr selbstdiszipliniert und regelkonform. Die Deutschen sind auch sehr umweltbewusst. Dies zeigt sich in politischen Aktionen bis hin zu verschiedenen Details im alltäglichen Leben. Aus Gesprächen mit anderen Teilnehmern konnte ich heraushören, dass auch sie die gleichen Eindrücke von der deutschen Kultur bekommen haben. Es war mir eine Ehre, an dieser Reise teilnehmen zu dürfen und meine Eindrücke mit allen zu teilen.

Leung Chin Lun



It was my pleasure to be invited by The Chinese Foundation Secondary School to participate in the Germany Education Tour. We went to different places in Germany including Berlin, Dresden, Nurnberg and Munich. I returned to Hong Kong one day earlier than the rest of the group to attend a rehearsal at The Hong Kong Academy for Performing Arts which I am studying in now.

The tour guide had a comprehensive knowledge of Germany and he shared his knowledge of the place with all the participants so that we could have a greater understanding of the country. In Germany, people have different habits from Hong Kong people, for example, Germany has a machine that recycles mineral water bottles and refunds money to the owner. Also, You need to buy a ticket to use a public toilet but the ticket becomes a cash coupon which you can use to buy any item in a shop.

The most impressive place for me was the Dachau Concentration Camp, the first concentration camp built by Nazi Germany. There they had a slogan which means 'work will set you free'. I found it a bit ironic when I knew the meaning of this slogan. It made me think of Hong Kong's long working hours, which is the longest in the world, with different industries facing the work overtime problem.

I listened to the tour guide explaining the life of the people in the concentration camp and the problems they faced. This concentration camp still houses some of the original buildings. The exhibition shows the details about the history of concentration camp and the situation of the prisoners at that time. I felt depressed when looking at it. Unfortunately, I didn't have enough time to look at all the information displayed in the exhibition. At the end of the trip, I bought a few books about the life of the prisoners from the book store.

The Germany Education tour brought us to different places in Germany, and exposed me to a different living environment and architectural style compared to Hong Kong. Thank you to The Chinese Foundation Secondary School for giving me the opportunity to participate in the tour.

We are especially grateful to the following people for their contribution in arranging visits for our Germany Education Tour.

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