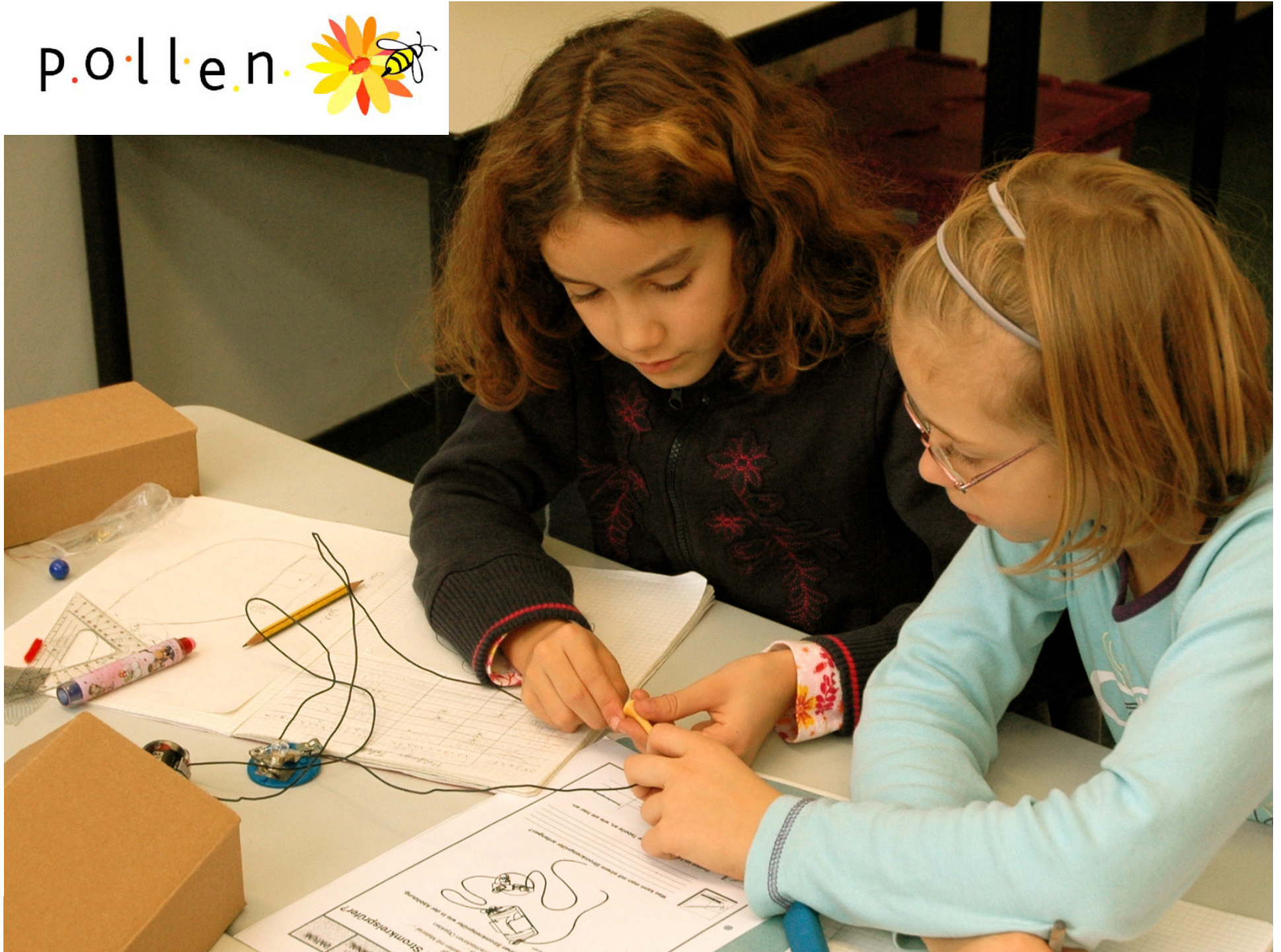


p.o.l.l.e.n. 



Implementation of the IBSE program Pollen in Germany

PD Dr. Skiebe-Corrette, 2.10.2009

International Conference: Science Education in School focused on inquiry based science education

TuWaS! ist eine Initiative von:



Integriert in TuWaS! ist:



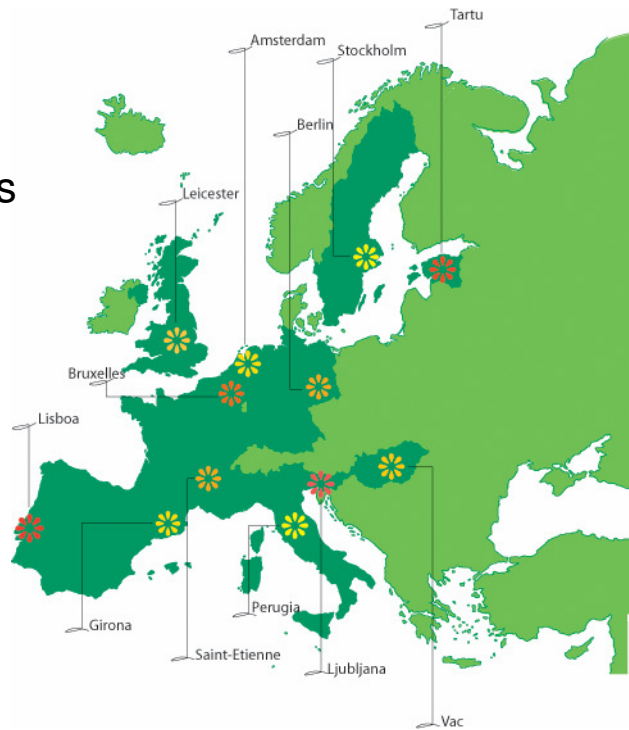
AGENDA

1. Pollen in Europe
2. Pollen in Germany
3. TuWaS! in Germany

p.o.l.l.e.n. in Europe and Berlin

Berlin as a model for other German cities

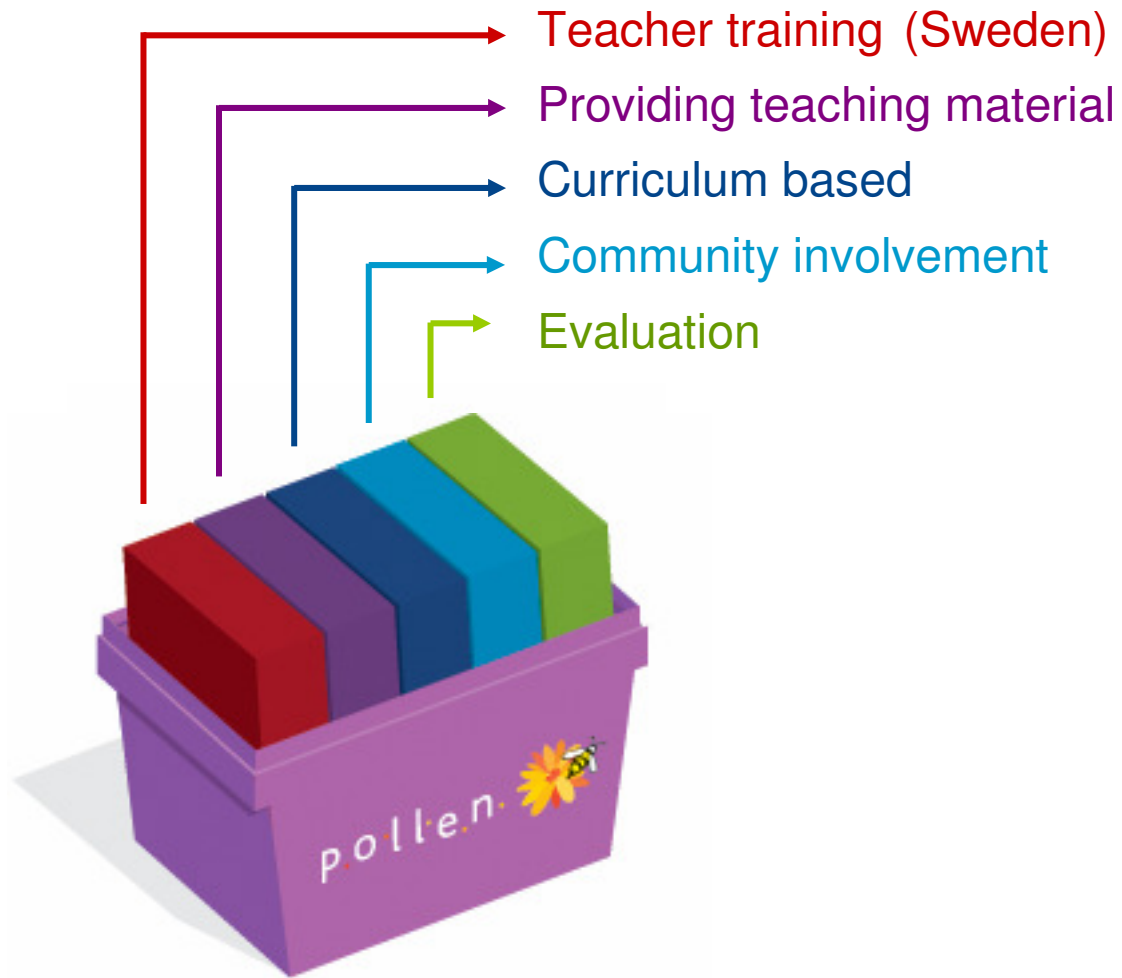
- **Goal:**
support 4 Mio. hours of science classes
duration: 3.5 years
- **Concept:**
100 primary schools
1 500 classes
37,500 pupils
- **Budget:**
1,75 Mio. EUR



Approach in Berlin

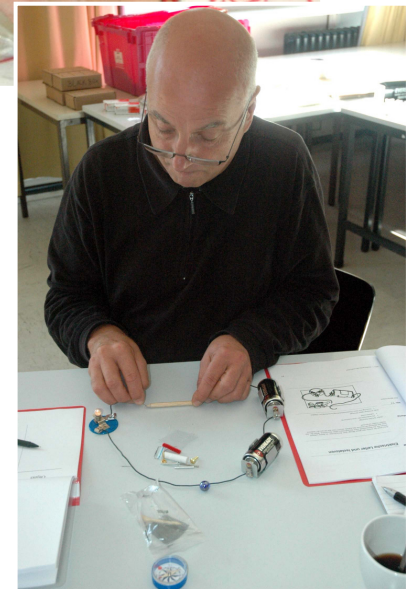
- **Start:**
January 2006
- **Goal:**
improve science education
10 primary schools
150 classes
3 750 pupils
- **Methods**
learn from partners

Learn from role models: Pollen Partners + NSRC (USA)

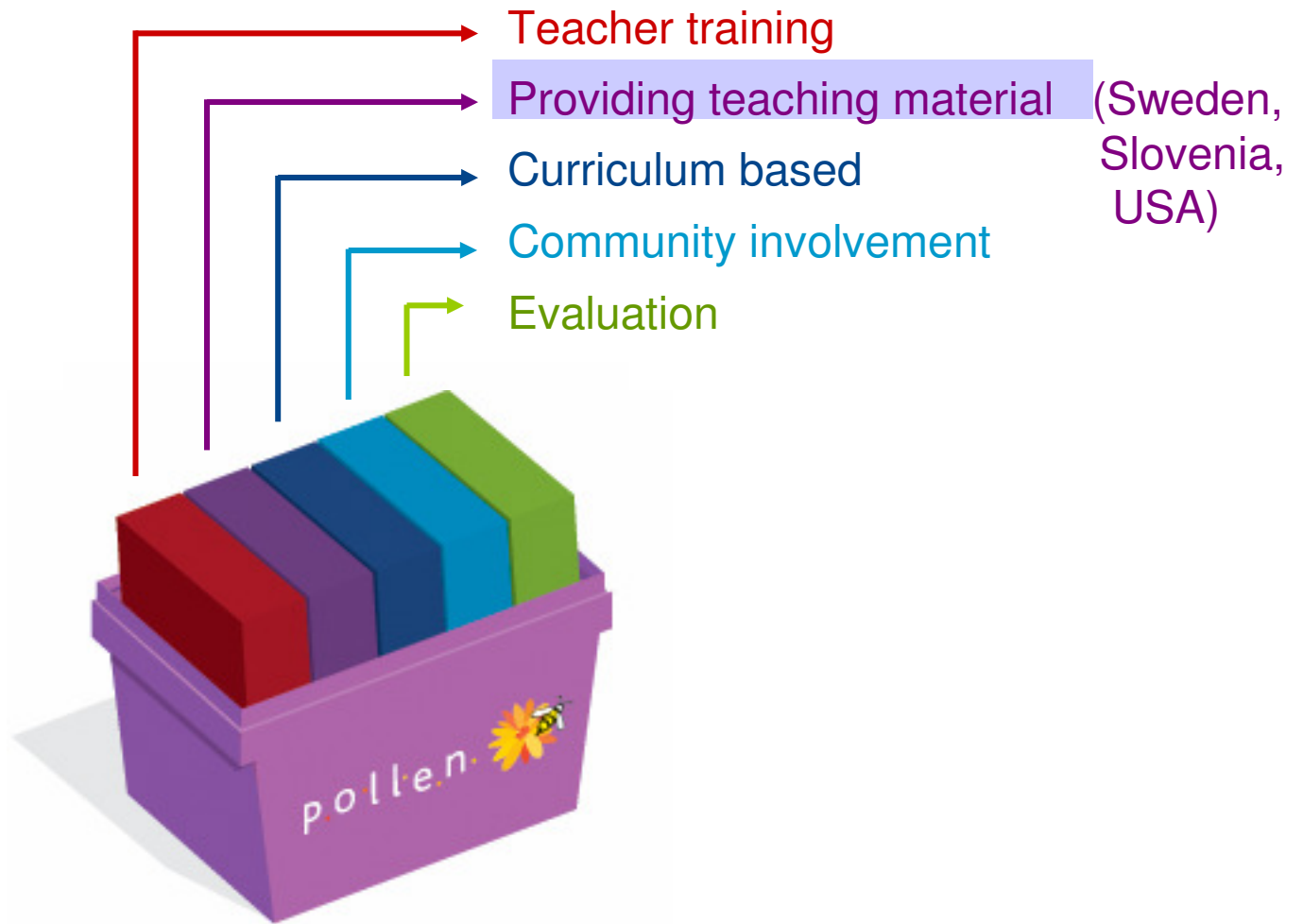


6 different topics for teacher Training

- Motion & Design
- Microworlds
- Chemical Tests
- Electrical Circuits
- The Life Cycle of Butterflies
- Solids & Liquids



Learn from role models: Pollen-Partners + NSRC



Researched based teaching material

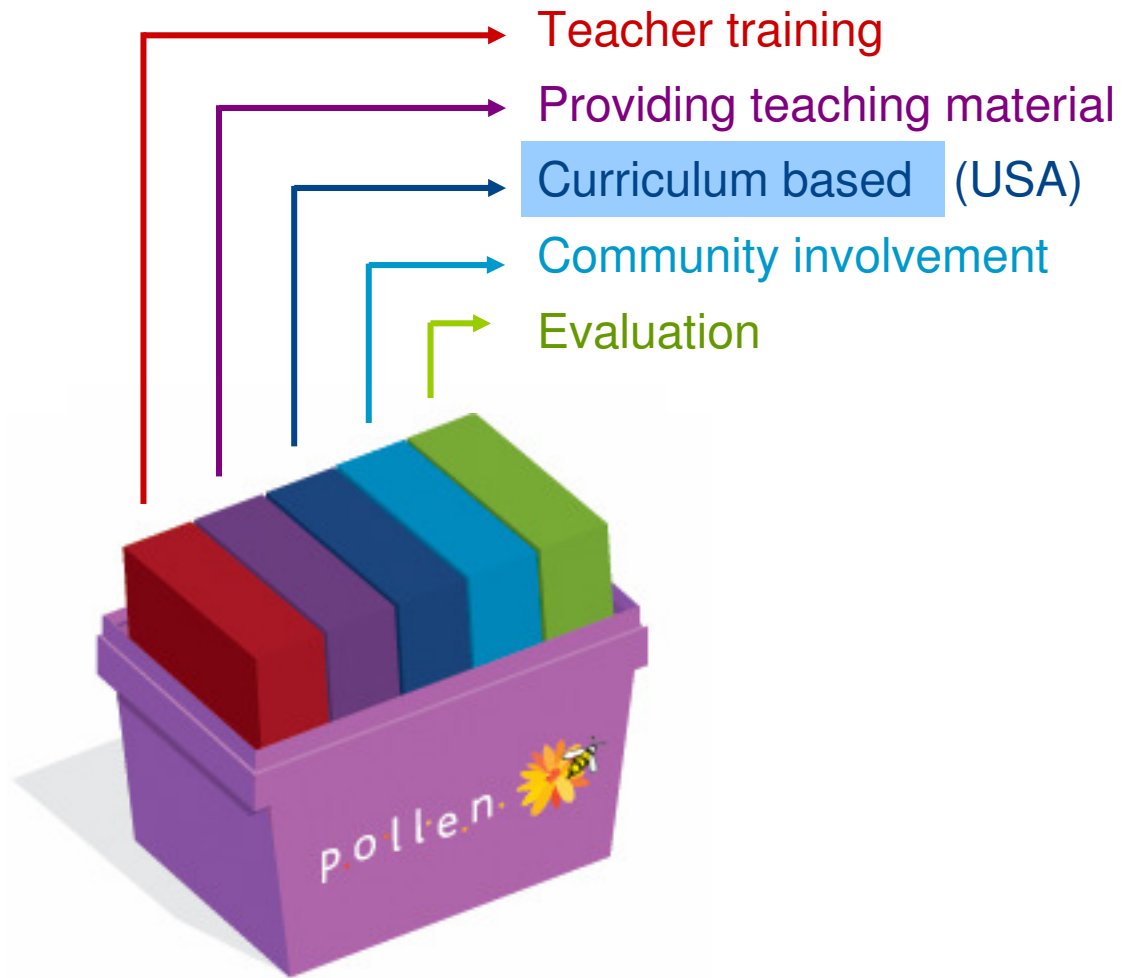
- Adaptation of units of the *National Science Resources Center*
- Is successfully used also in the USA, Sweden, Mexico and Chile
- Experimental material for 30 pupils
- Student and teacher guides
- 16 lessons for each topic
- 24 Topics



24 Topics for primary schools

Grade	Biology	Earth Science	Physics & Chemistry	Technology
1	Organisms	Earth science	Solids and Liquids	Comparing and Measuring
2	The Life Cycle of Butterflies	Soils	Changes	Balancing and Weighing
3	Plant Growth and Development	Rocks and Minerals	Chemical Tests	Sound
4	Animal Studies	Land and Water	Electrical Circuits	Motion and Design
5	Microworlds	Ecosystems	Food Chemistry	Floating and Sinking
6	Experiments with Plants	Measuring Time	Magnets and Motors	The Technology of Paper

Learn from role models: Pollen-Partners + NSRC

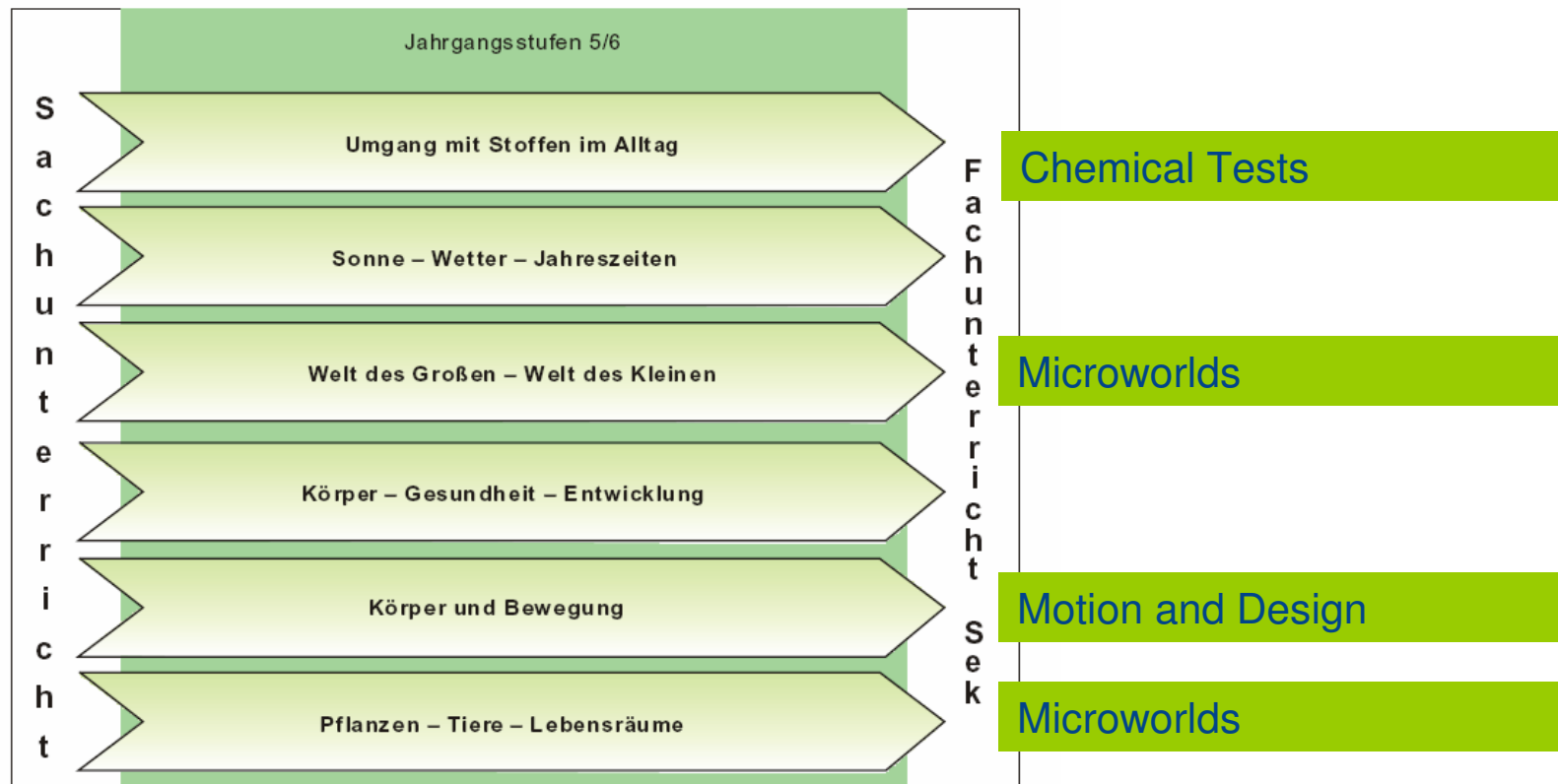


Science curriculum grades 5 + 6

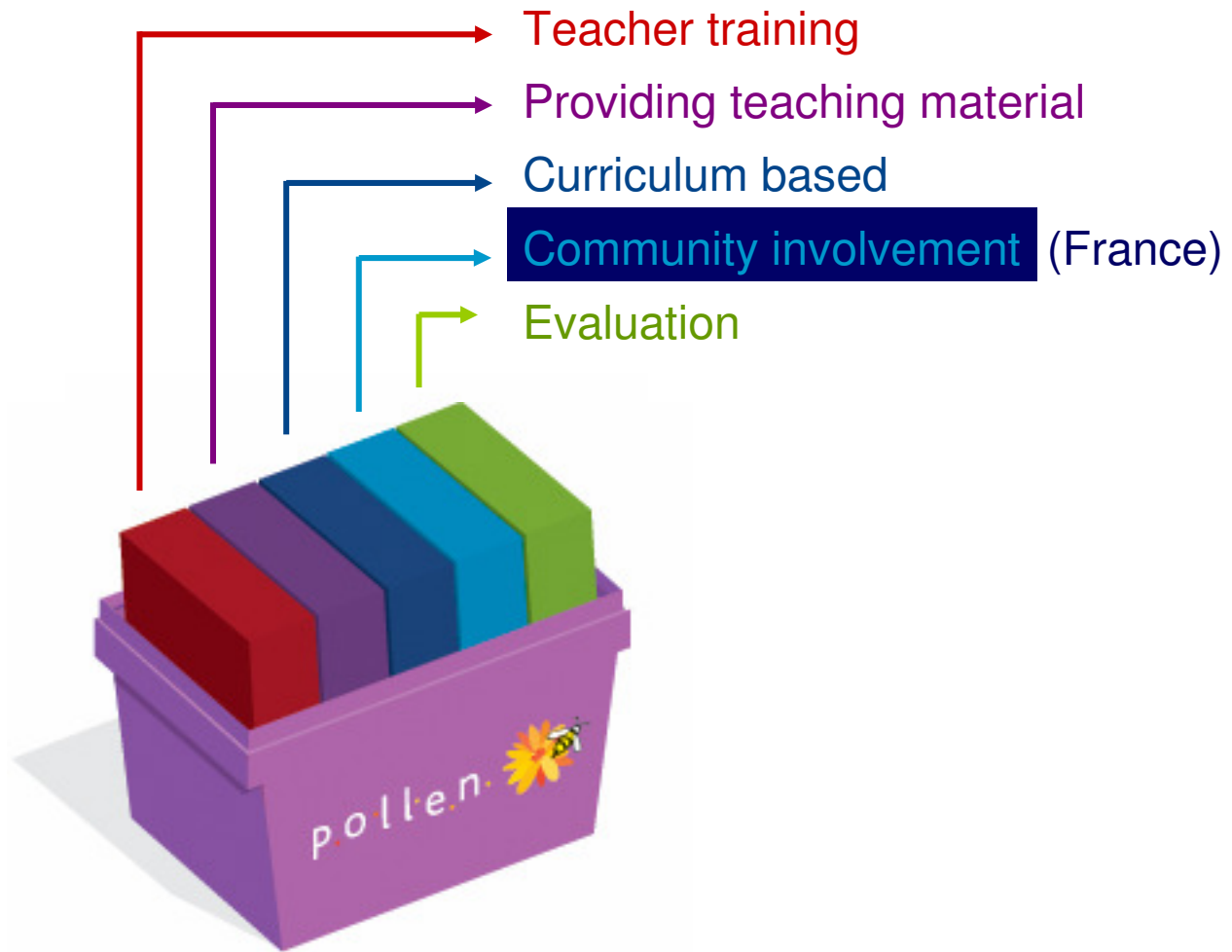
Standards at the end of grade 6

- All skill related standards are covered by the teaching material
- 85% of the subject related standards are covered

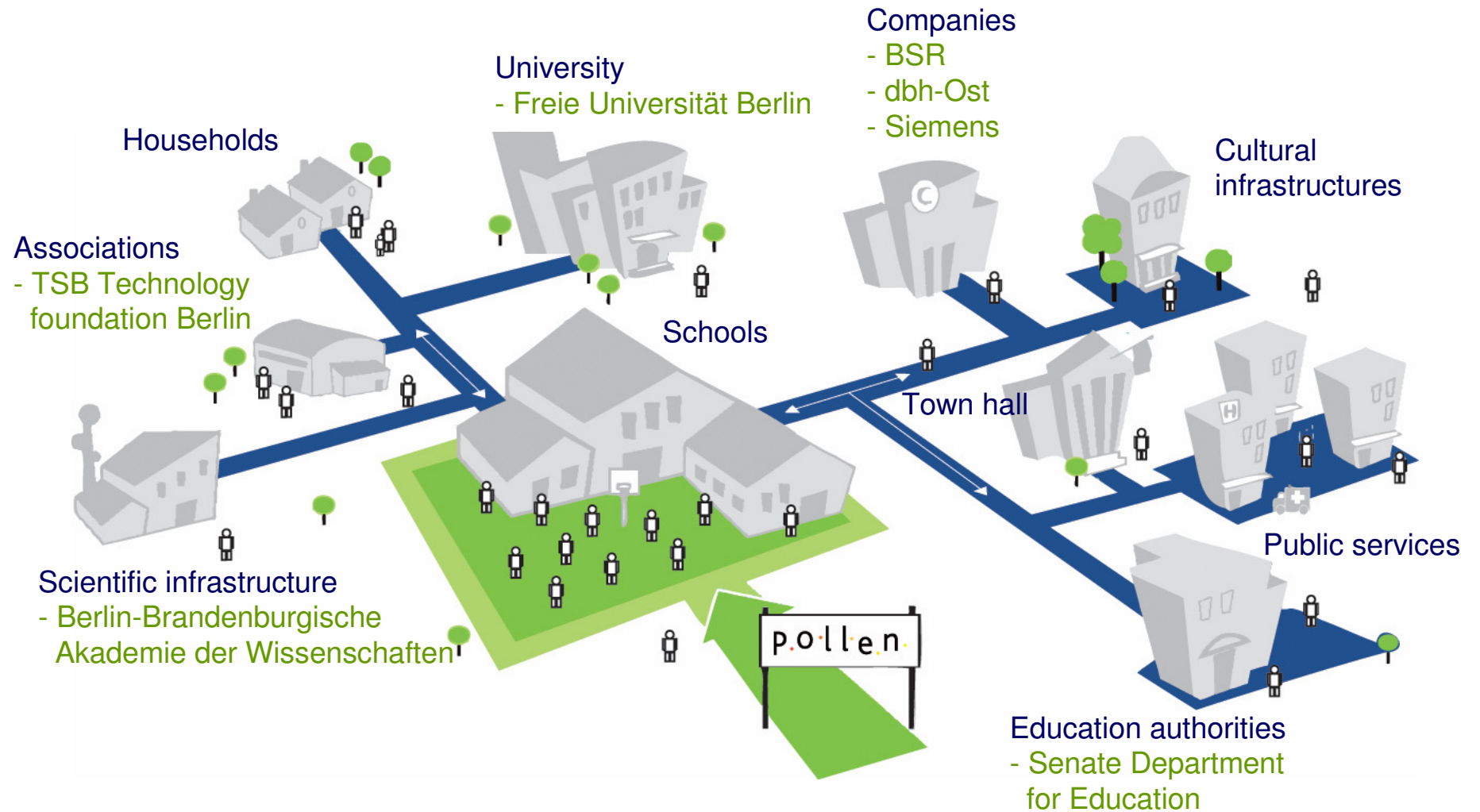
5.1 topics



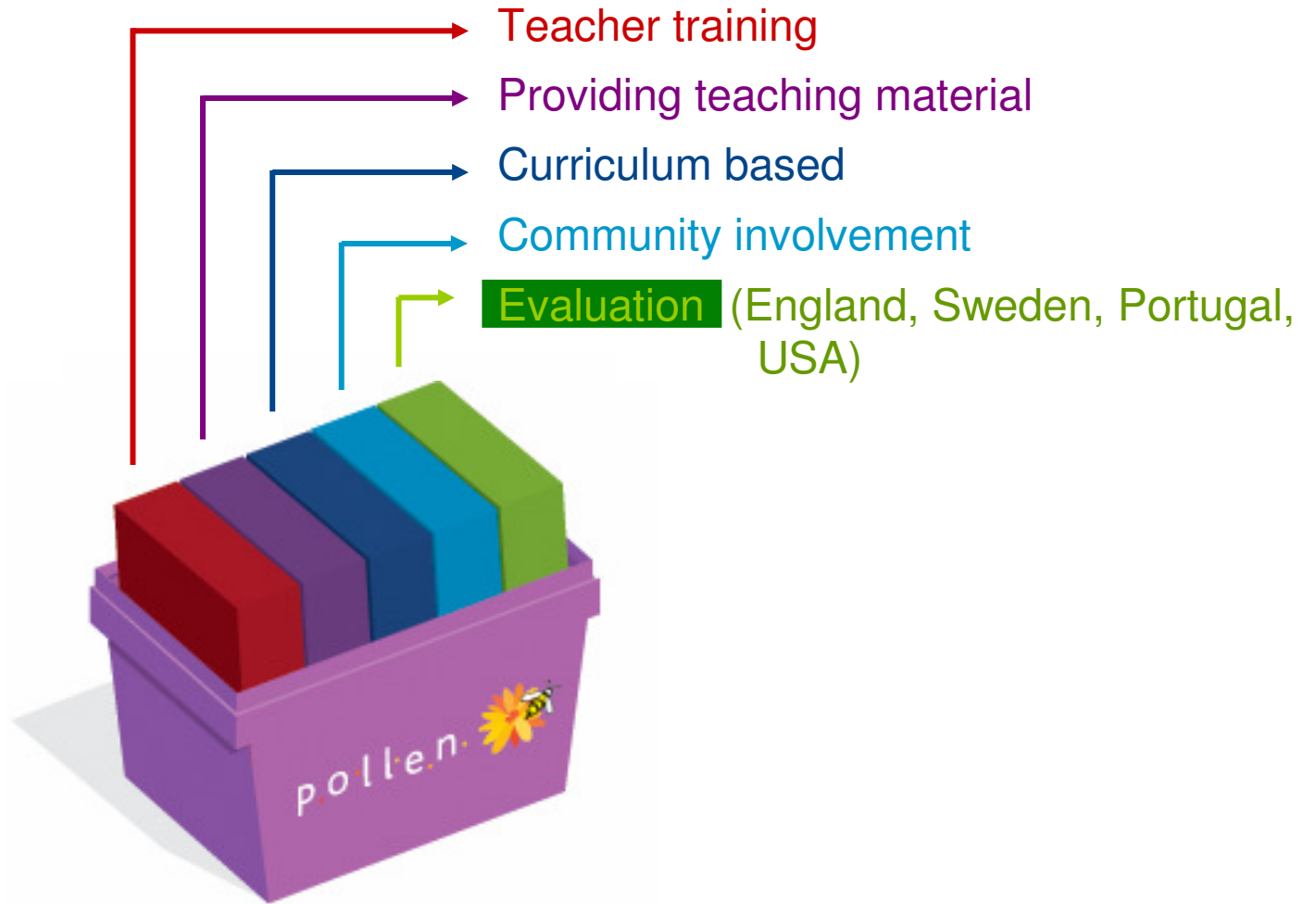
Learn from role models: Pollen-Partners + NSRC



Community involvement



Learn from role models: Pollen-Partners + NSRC



Teachers' Changing Confidence and Attitudes over Two Years

Tina Jarvis, Anthony Pell and Phil Hingley, University of Leicester

- average of over 20 years teaching experience
- teachers' confidence in teaching science and technology showed a substantial gain on all aspects except biology
- is higher if more classes have been taught
- even experienced science teachers show increases in confidence
- teachers increasingly valued the in-service
- attitudes towards the importance of making links to everyday experience and the science of the past also increased
- limited interaction with the local community

Suggested reasons

- High quality long-term in-service training
- Material support
- Good match with the curriculum
- Additional funding

THINK BIG and long term – Look for Partners



TuWaS!

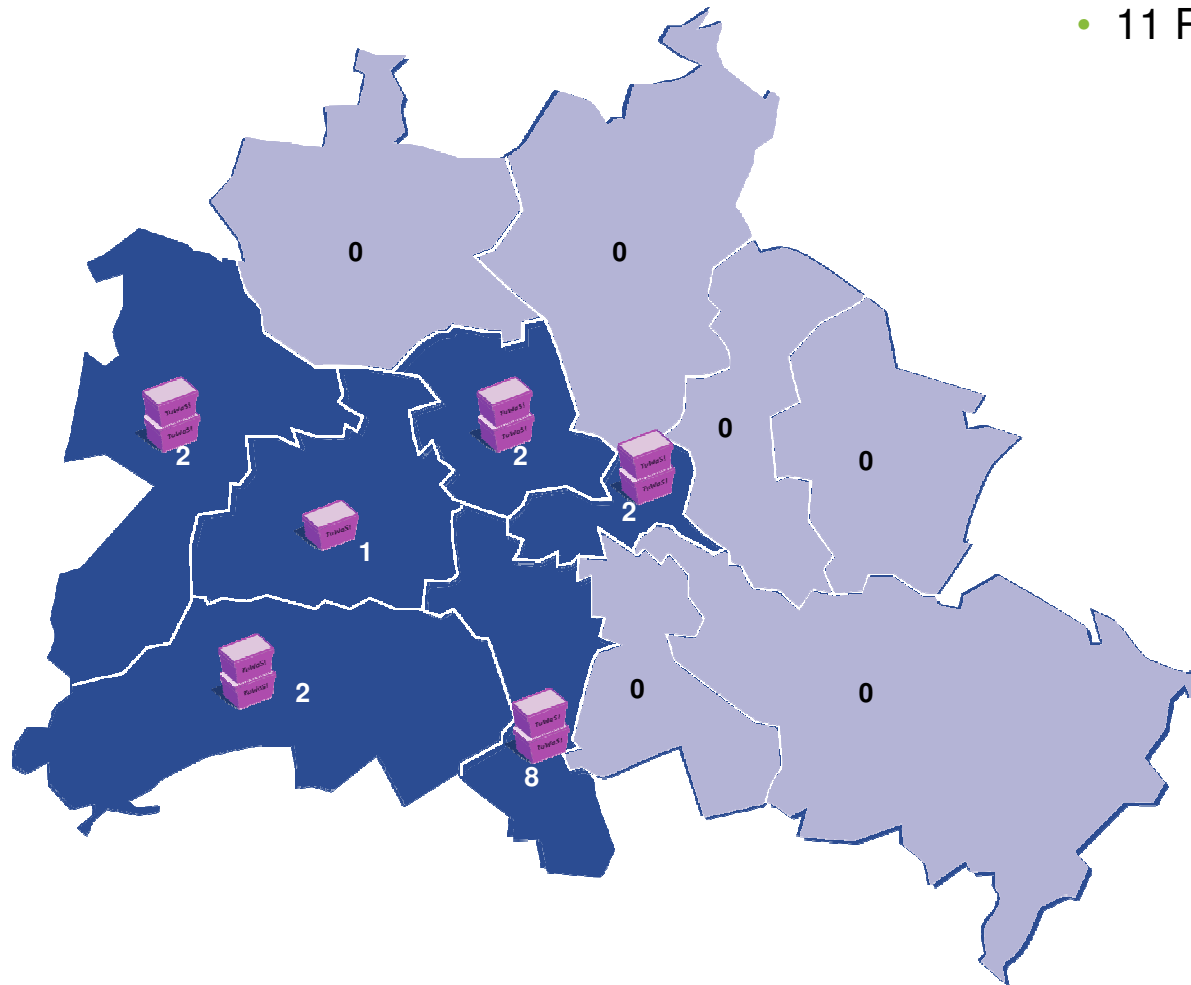
Technik und
Naturwissenschaften
an Schulen

Freie Universität  Berlin


berlin-brandenburgische
AKADEMIE DER WISSENSCHAFTEN

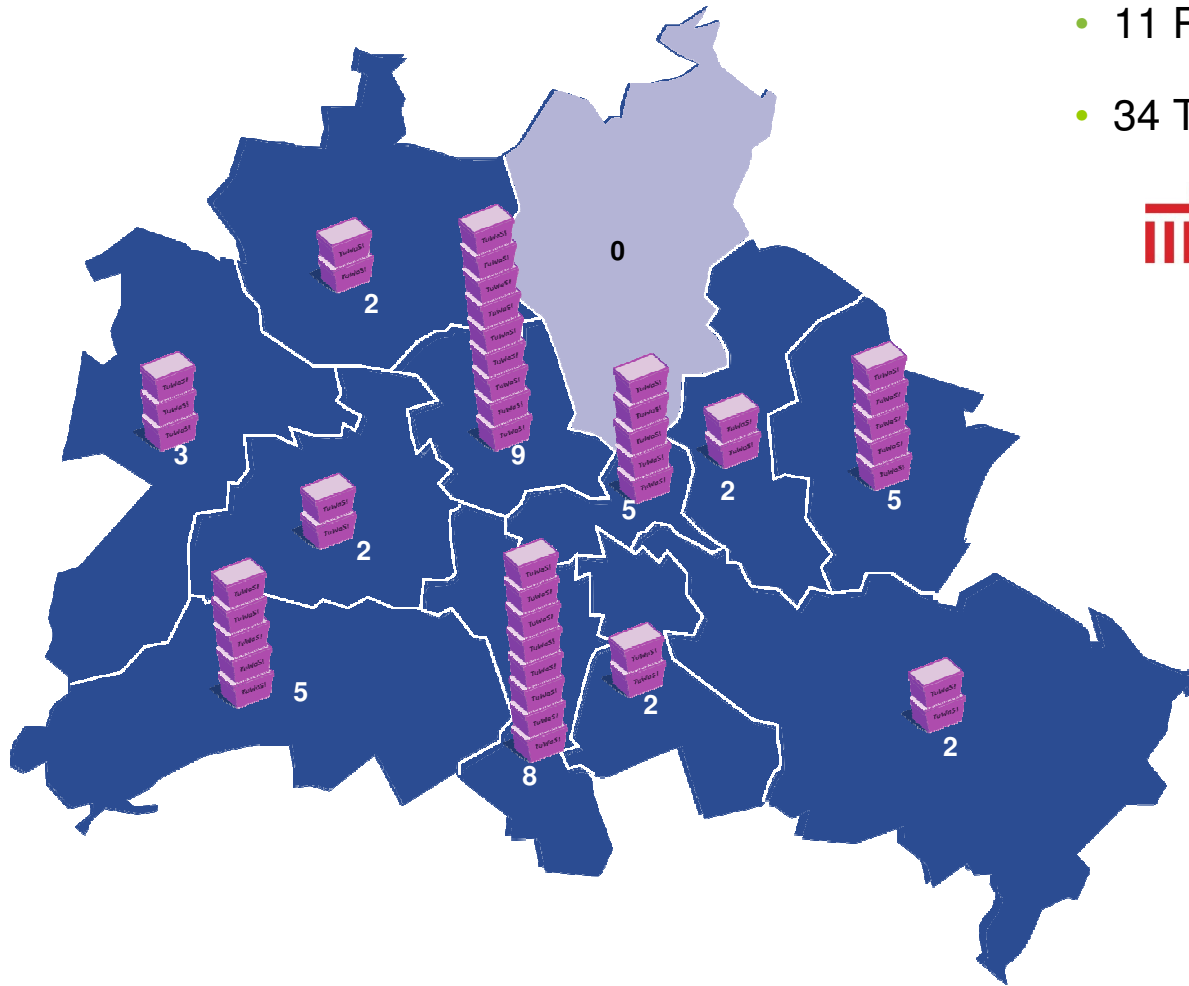
Dissemination of TuWaS! in Berlin

- 11 Pollen schools

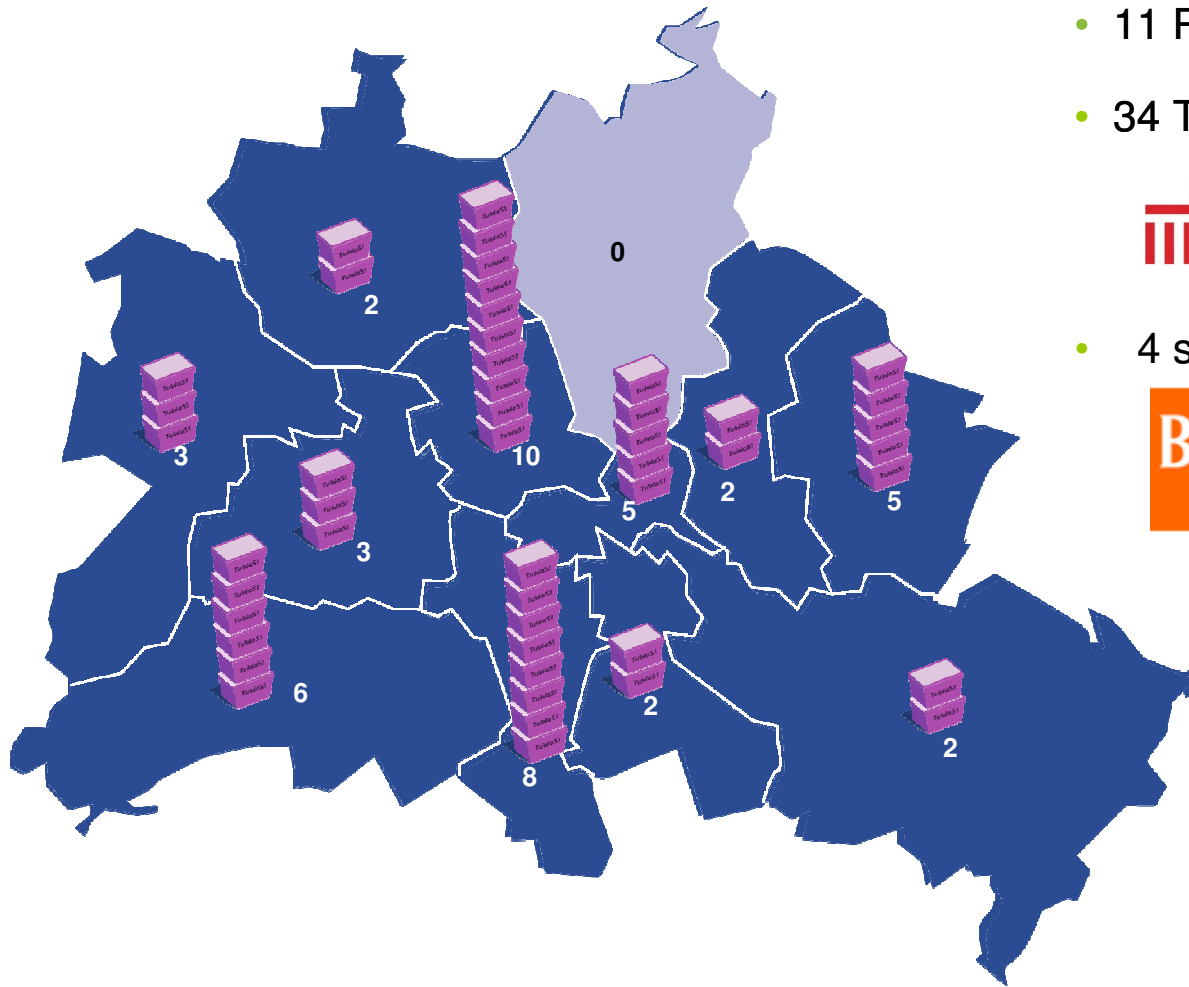


Dissemination of TuWaS! in Berlin

- 11 Pollen schools
- 34 TuWas! schools



Dissemination of TuWaS! in Berlin



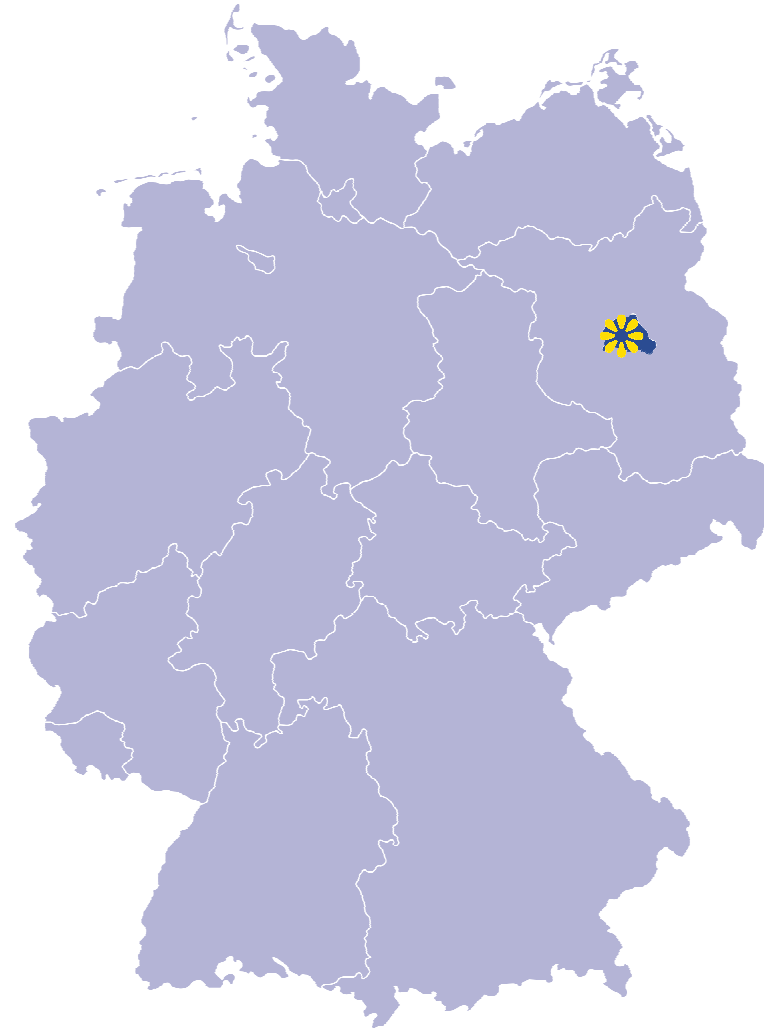
- 11 Pollen schools
- 34 TuWas! schools



- 4 schools



Dissemination within Germany



Berlin

49 schools

281 teachers

- EU
- TSB Technology foundation Berlin
- Senate Department for Education



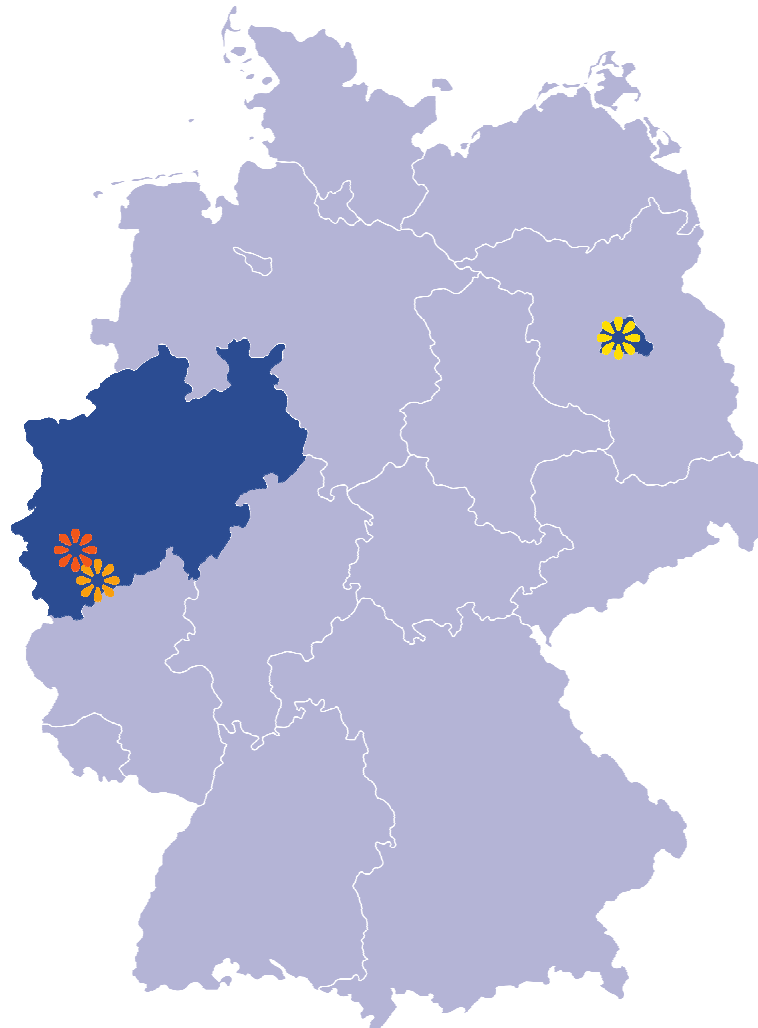
Dissemination within Germany

Pollen-Website Nordrhein-Westfalen

21 schools

66 teachers

- Chamber of Industry and Commerce (IHK) of Köln
- IHK Bonn / Rhein-Sieg



Berlin

49 schools

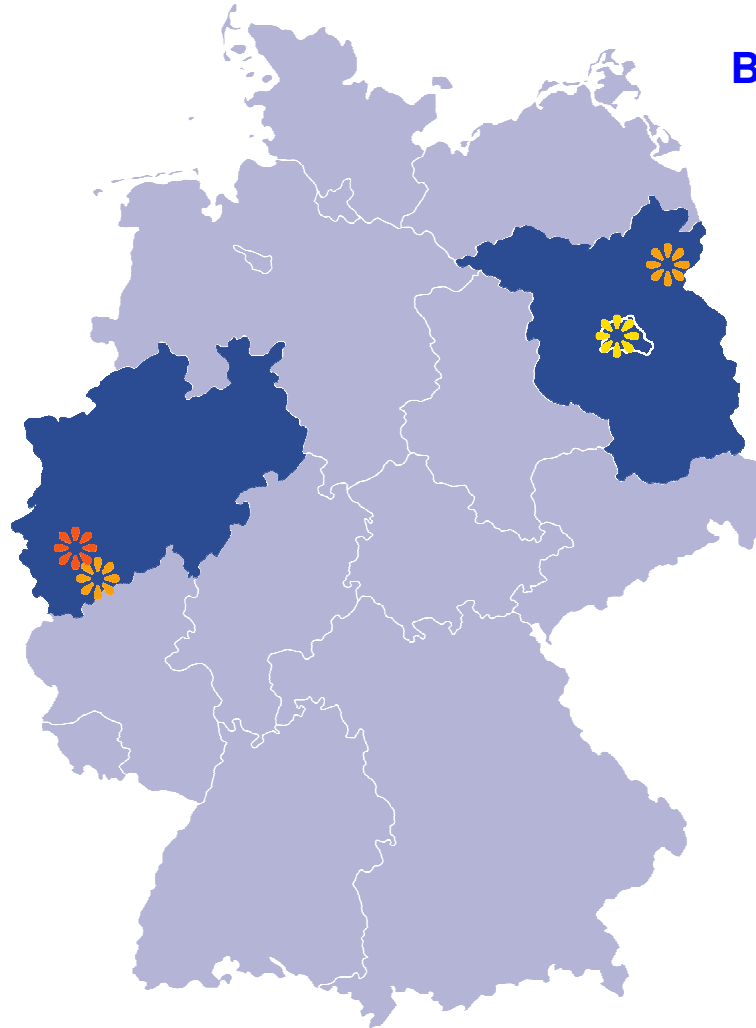
281 teachers

- EU
- TSB Technology foundation Berlin
- Senate Department for Education

Dissemination within Germany

Pollen-Website **Nordrhein-Westfalen**

- 21 schools
- 66 teachers
- Chamber of Industry and Commerce (IHK) of Köln
- IHK Bonn / Rhein-Sieg



Brandenburg

- 1 schools
- 5 teachers
- 2009: 6 schools
- the Association of the German metal and electrical industry

Berlin

- 49 schools
- 281 teachers
- EU
- TSB Technology foundation Berlin
- Senate Department for Education

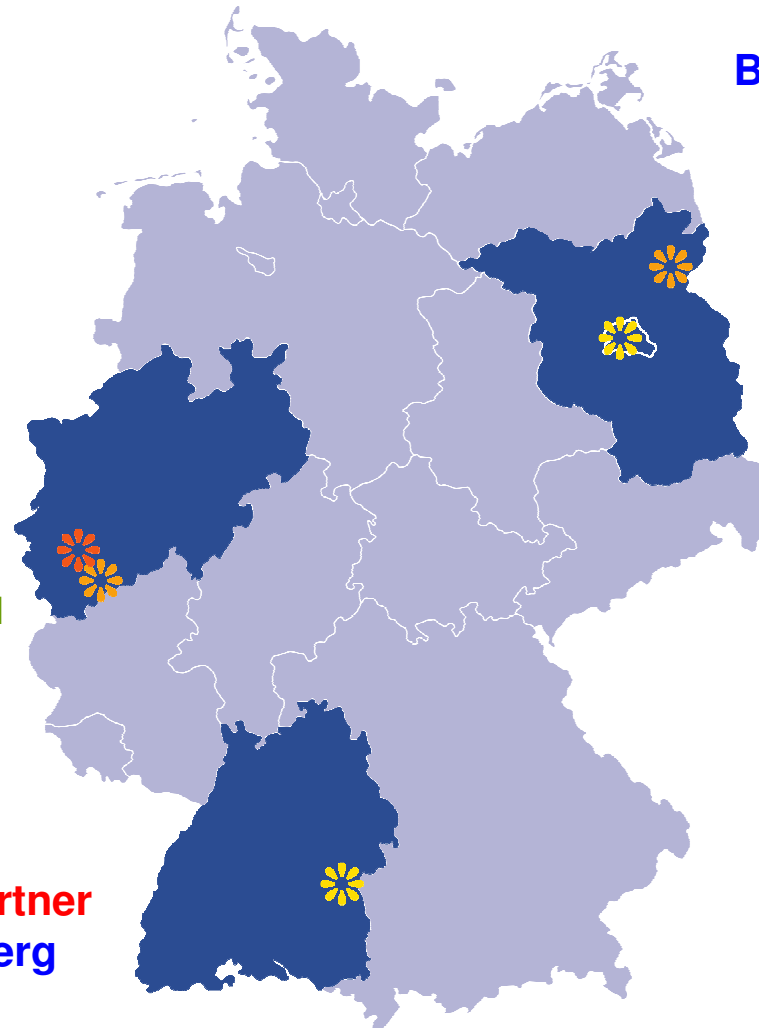
Dissemination within Germany

Pollen-Website **Nordrhein-Westfalen**

21 schools
66 teachers
- Chamber of Industry and Commerce (IHK) of Köln
- IHK Bonn / Rhein-Sieg

French Pollen-Partner **Baden-Württemberg**

16 teachers
IHK Ulm



Brandenburg

1 schools
5 teachers
2009: 6 schools
- the Association of the German metal and electrical industry

Berlin

49 schools
281 teachers
- EU
- TSB Technology foundation Berlin
- Senate Department for Education



Future challenges?

1. **Extend TuWaS! from covering 12 % of the primary schools in Berlin to 50 %**
Funding is missing
2. **Training student teachers for primary school**
First steps are done at the Freie Universtät Berlin
3. **Training center for IBSE for primary school teachers**
**Part of the contract between Freie Universtät Berlin
Berlin-Brandenburg Academy of Science**
4. **Material center that provides the materials for the teachers of Berlin and is a model for other cities**
**Freie Universtät Berlin provided the space
Personel is missing**
5. **Dissemination center for other cities in Germany that want to implement a science reform program**
Part of Fibonacci



THANK YOU FOR YOUR ATTENTION

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Initiatoren:



Sponsoren:



Programs promoting IBSE funded by the European Union



Coordinators: La main à la pâte

- 5 partners + 2 associated partners
- 2004 – 2006
- Organising a conference to promote IBSE



- 12 partners + 4 observing countries
- 2006 – 2009
- Supporting IBSE in 12 “Seed cities”



- 24 partners from 21 European countries
- 2010 – 2012
- Disseminate what has been learned from Pollen and Sinus-Transfer



12 Partners



- École Normale Supérieure – LAMAP - FRANCE
- Université libre de Bruxelles – BELGIUM
- University of Tartu – ESTONIA
- Freie Universität of Berlin – GERMANY
- Consortium Innovation Training Educational Inquiry – ITALY
- Universiteit van Amsterdam – NETHERLANDS
- Ciência Viva – PORUGAL
- P.A.U. Education – SPAIN
- Royal Swedish Academy of Sciences – SWEDEN
- University of Leicester – UNITED KINGDOM
- Apor Vilmos Catholic College – HUNGARY
- University of Ljubljana – SLOVENIA.