

**astra\***

**The National Centre for Science Education, Denmark**

# About Astra\*

- Independent institution affiliated with the Danish Ministry of Children and Education
- App. 60 FTE
- 33/67 public/private funding
  
- Knowledge centre
- Networking facilitator
- Large programmes and events
- National talent programme



# Mission and vision

Astra's vision is:

- *All* children should acquire strong motivation and competences in STEM so they can contribute to society in a critical and creative way
- *More* children should choose STEM in education and work

Astras mission is to:

*Be a nationwide facilitator for initiatives to strengthen children's competences within science and to recruit more young people to STEM*

## We know that more children would choose STEM if

- They tried to experiment themselves
- They knew that we don't know all answers already
- They could see that STEM can change the world
- They could see that STEM careers are cool
- They knew that you don't have to be a genius

Sjøberg, S. (2004). The Relevance of Science Education (The Rose-Project)

## ...and we know good science education

- Is relevant to the pupils and authentic in its subject matter
- Includes engineering, technology, computational thinking and has a closer link to mathematics
- Is inquiry-based and problem-based
- Works with continuous formative feedback
- Allows room for argumentation and discussion, so pupils can relate to STEM subjects and societal challenges from a STEM perspective
- Collaborates with informal learning environments outside of the school

Conclusions from a large international review of didactical research in  
Bohm 2017: Sammen om Naturvidenskab - anbefalinger til en national naturvidenskabsstrategi”



# MARIAS NATURVIDENSKABELIGE REJSE



# Strategic approach

**Pupils** should have inspiring STEM teaching

**Teachers** need inspiration

**Society** should support STEM in schools

**Policy** makers should make clear goals

And we need more coordination, evaluation and knowledge

# Strategic approach

**Pupils** should have inspiring STEM teaching - *we work with talents*

**Teachers** need inspiration - *we make resources and conferences*

**Society** should support STEM in Schools - *we ake networks and facilitate strategy*

**Policy** makers should make clear goals - *we advise*

And we need more coordination, evaluation and knowledge - *we make databases, evaluate projects and make theories of change*



# Pupils - directly with talents

We work directly with the most talented, indirectly with all through teachers

- Camps for 3.000/year
- Young scientists competition (200 finalists)



# Teachers - the most important factor

- Big Bang annual teacher conference (1.600 participants)
- “Translation” of formal curriculum documents and rules into practise
- Development of new materials, e.g. Engineering, events
- Easy to use resources, e.g. experiment database
- Special programme for talent advisers



# Big Bang conference

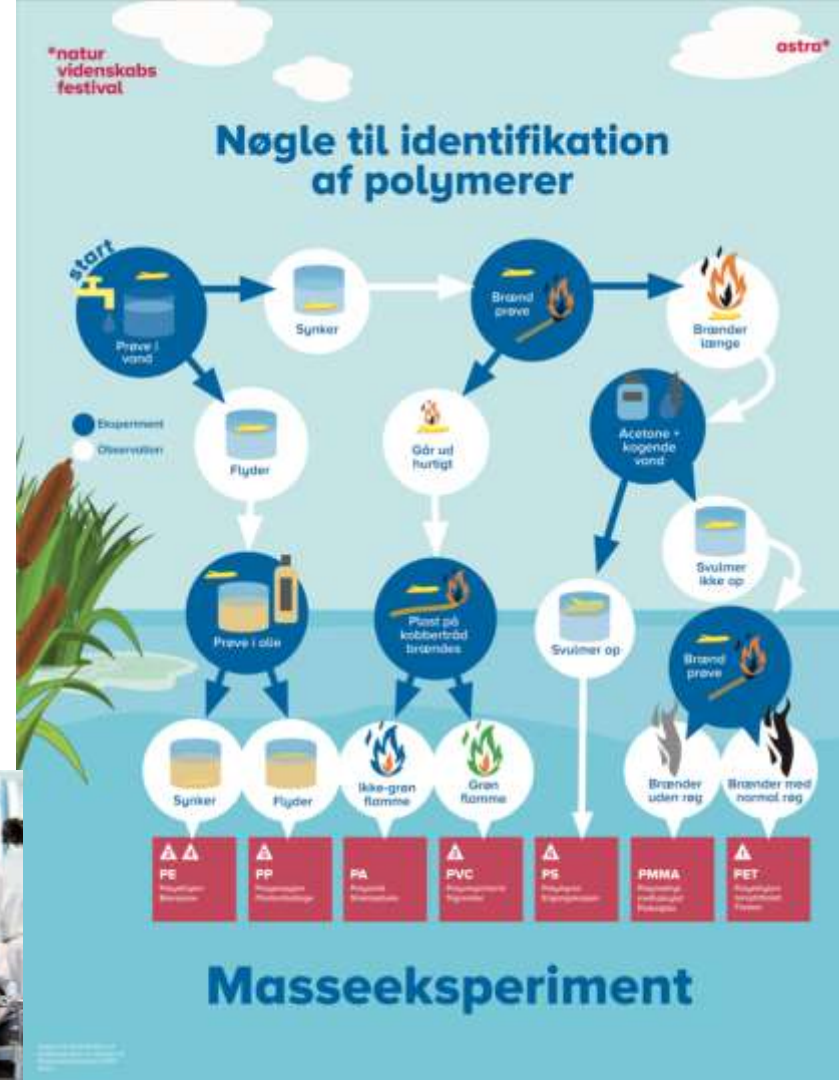
## 2020 tracks:

- Didactic research into practise
- Great discoveries
- Pupils' practical inquiry-based work
- STEM in industry
- The future is green
- Engineering and Technology
- Collaborations and bridges between educational levels
- New science
- Inquiry-based education - how to?



# Mass Experiment

- 57.000 pupils
- Mapping plastic pollution
- Biggest mapping in the world
- 374.242 samples analyzed
- Results to European Environmental Agency



# Strategic capacity building in networks

- Team of “travelling consultants” - each with 15-20 municipalities
- Annual meetings with local authorities
- Twice a year regional meetings
- One big annual conference
- Meeting at Big Bang Conference



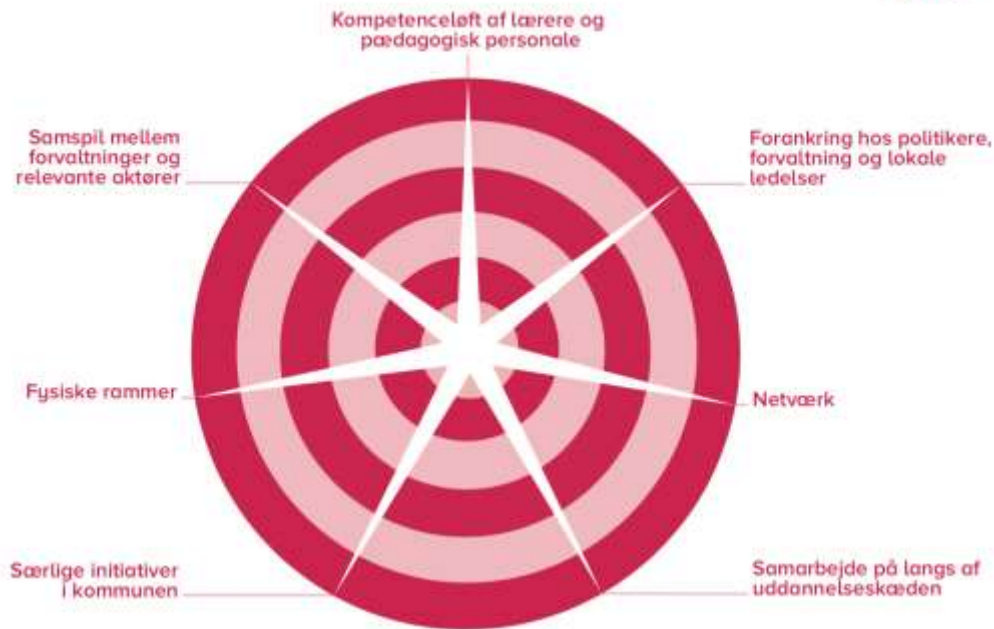
*Annual meeting of coordinators at  
the Big Bang conference*



*There are 98 municipalities in  
Denmark - Astra has contact with  
most*

# Strategic capacity building in networks

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# More networks

- School management and coordinators
- Coordinators in High Schools
- Coordinators in Vocational institutions
- Project owners, foundation, researchers



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# Knowledge and evaluation

- There is A LOT going on in Denmark - big foundations invest
- Advice and dialogue with project builders
- Reports on various subjects to foundations and authorities
- Evaluation centre with University of Copenhagen
- Study trips (e.g. Technology Pact in NL or Science Capital in UK)



Naturfagernes evaluerings- og udviklingscenter





## Political trends 2018-19

