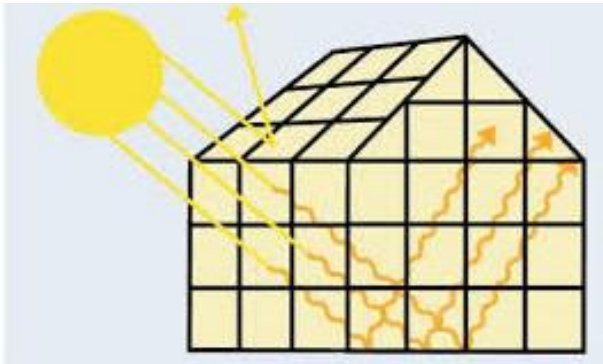
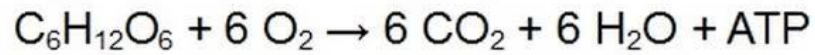
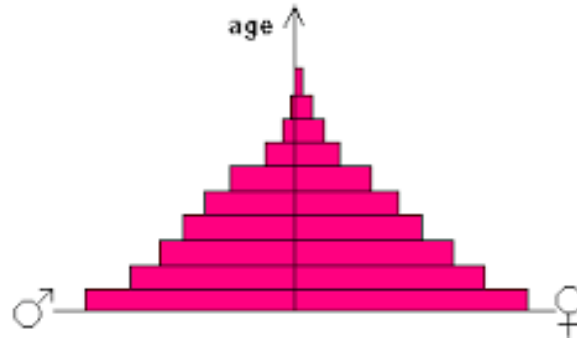


Modelleringskompetence i grundskolen: forslag til et rammeværk



Eksempler på modeller udtrykt som eksterne artefakter



Overordnet formål for en kompetenceorienteret naturfagsundervisning

**Uddannelses-
forskning i
naturfag**
Teoretiske
intentioner
Hvad,
hvordan &
hvorfor

Fælles Mål
Politiske
intentioner
Hvad,
hvordan &
hvorfor

**Lærernes
praksis**
Hvad,
hvordan &
hvorfor

Modelleringskompetence rammeværk



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hvorfor

Modelleringskompetence rammeværk

Meta-viden om
modeller og
modellering

Learning about
science

Modellerings-
aktiviteter

Doing science

Naturfaglige
begreber og
sammenhænge

Learning science

Kompetenceorienteret undervisning

Motiveret og reflekteret parathed til at *anvende* naturfaglig undren, viden, færdigheder, strategier og metaviden til at *løse* problemstillinger og opgaver i *forskellige situationer* som indeholder faglige udfordringer.

Inspireret af: Busch, H., Elf, N. F. & Horst, S. , 2004; Dolin, Krogh & Troelsen, 2003; Nielsen & Gottschau, 2005.

Learning
science

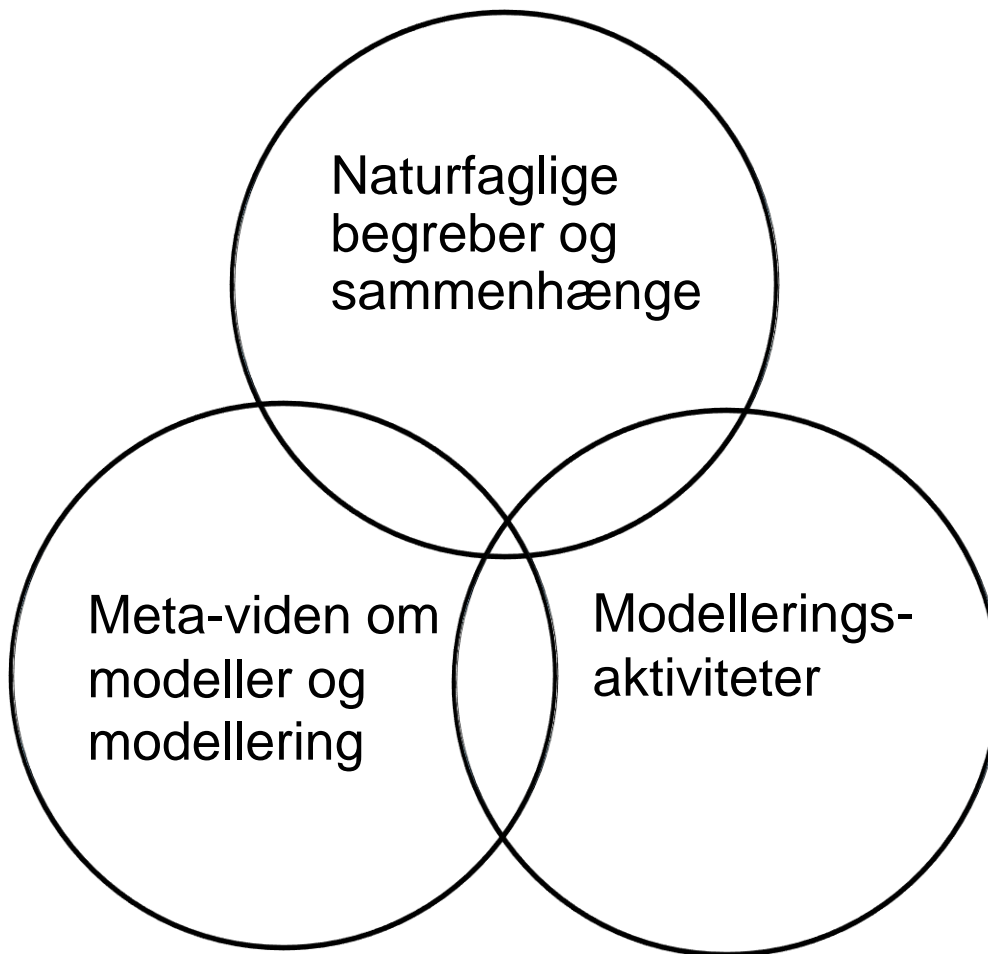
Naturfaglige
begreber og
sammenhænge

Learning
about
science

Meta-viden om
modeller og
modellering

Modellerings-
aktiviteter

Doing
science



Modelleringsaktiviteter

- Beskrive, forklare og kommunikere med modeller
- Forudsige med modeller
- Sammenligne modeller
- Vælge modeller
- Konstruere modeller
- Evaluere modeller
- Revidere modeller

Metaviden om modeller

- Modeltyper og karakteregenskaber for modeller
- Formål, værdi og anvendelse af modeller og modellering i forskning, samfund og uddannelse
- Modellers muligheder og begrænsninger



Naturfaglige begreber og sammenhænge repræsenteret i modeller

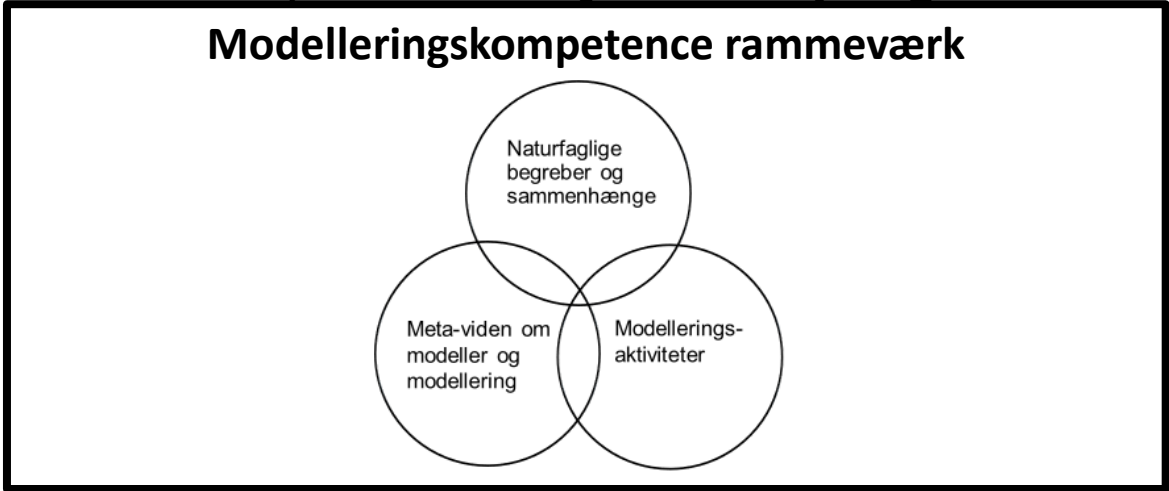
- Idé
- Proces
- Begivenhed
- System
- Objekt

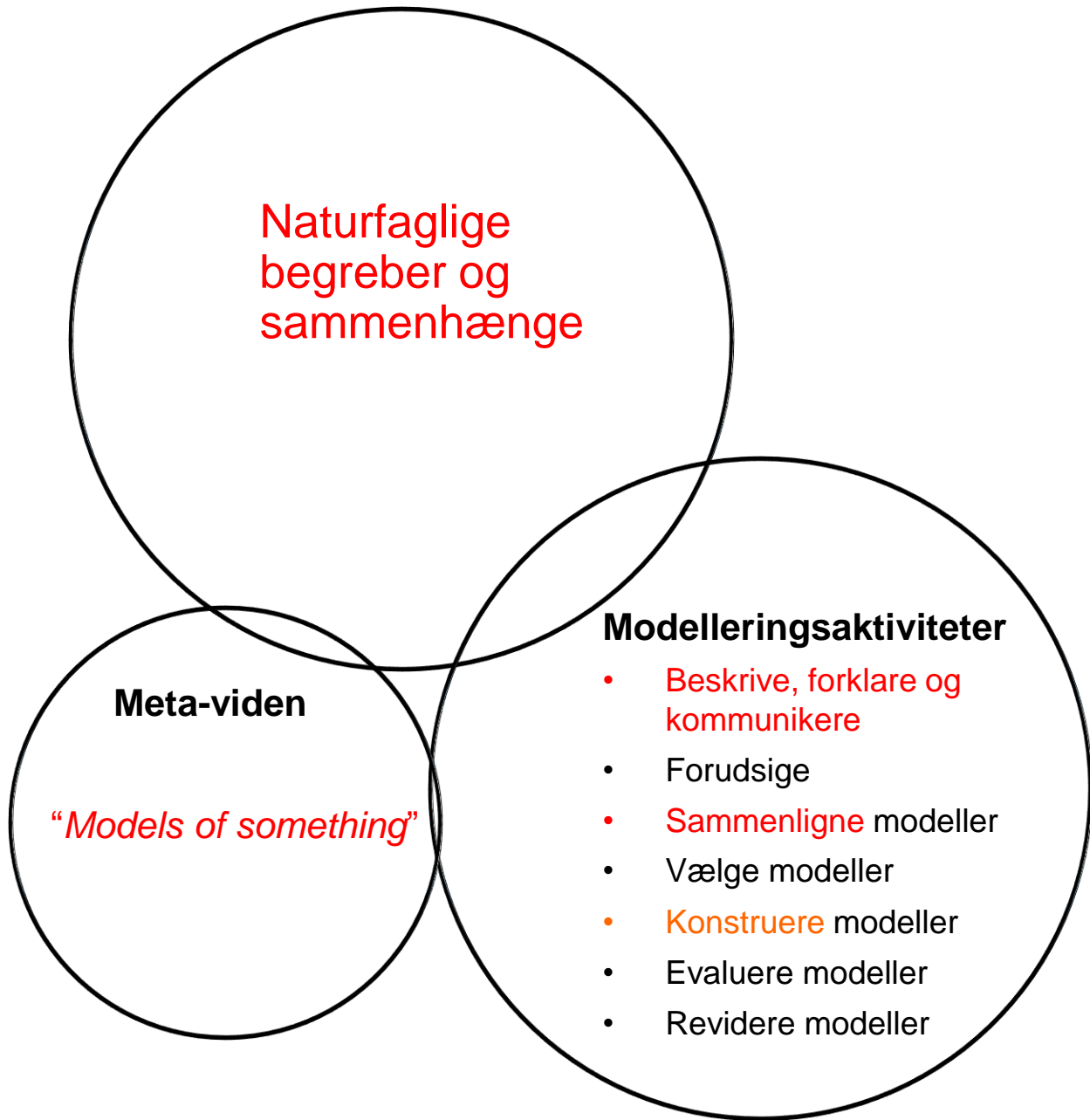
Overordnet formål for en kompetenceorienteret naturfagsundervisning

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Product-oriented: Focus on the nature and use of established models to describe, communicate and explain science concepts and relations

- Models *of* something
- The content knowledge of models
- Descriptive

Competence-oriented: Focus on why and how to use models in different situations and for different purposes e.g., task/problem-solving, “thinking tools”, tools for inquiry

- Models *for* something
- The process of modelling targeted different purposes
- Predictive

Uddannelse herunder styringsdokumenter

- Highlight models' predictive functions and the dynamic process of designing, evaluating, and revising models
- Elaborate on how to evaluate models based on function and relate it to a specific question, problem or purpose
- Specifying the link between modelling competence and the main learning goals
- Exemplify how models and modelling are used as tools for inquiry

- Modelling holds promise for facilitating students' learning of science concepts, scientific reasoning processes, and awareness of how science operates (Nicolaou & Constantinou, 2014).
- Need for a more central and equal role in science teaching: learning science, doing science, and learning about science (Hodson, 2014; Kind & Osborne, 2017).
- A core scientific practice and add coherence to the science curriculum (Lehrer & Schauble, 2015; Passmore, Stewart & Cartier, 2009)

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