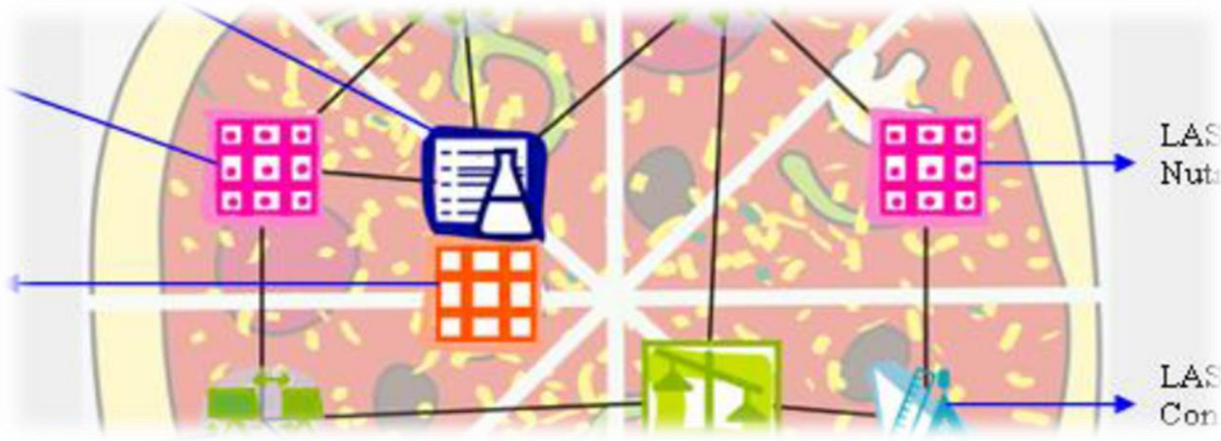
1.1	A healthy Pizza

de Jong, T., van Joolingen, W.R., Giemza, A., Girault, I., Hoppe, U., Kindermann, J., Kluge, A., Lazonder, A.W., Vold, V., Weinberger, A., Weinbrenner, S., Wichmann, A. Anjewierden, A., Bodin, M., Bollen, L. d´Ham, C., Dolonen, J., Engler, J., Geraedts, C., Grosskreutz, H., Hovardas, T., Julien, R., Lechner, J., Ludvigsen, S., Matteman, Y., Meistadt, Ø., Næss, B., Ney, M., Pedaste, M., Perritano, A., Rinket, M., von Schlanbusch, H., Sarapuu, T., Schulz, F., Sikken, J., Slotta, J., Toussaint, J., Verkade, A., Wajeman, C., Wasson, B., Zacharia, Z.C., & van der Zanden, M. - University of Twente



Short Description:

By designing a pizza that is both tasty and healthy, children learn about nutrients and the relation between energy use and intake though food.

Aims:

The main aim is that learners learn to see the relation between various ingredients and the nutritional value of prepared food, using the pizza as an example.

Fostered Skills:

From a student point of view

General learning goals

- I can identify problems and formulate hypotheses.
- I can design, plan and perform experiments to test the hypotheses.
- I can organize, analyze and interpret data.
- I can collaborate with peers (share tasks/information, collaborate on experiments, make decision together, etc.).
- I can plan and monitor my own learning process.
- I can reflect on my own knowledge and learning goals.
- I can present in the presence of a large group (partners and/or classmates).
- I can write individual reports and assignments.
- I can perform simple calculations (e.g., additions and multiplications) or calculations with simple formulas (e.g., BMR and BMI).

Mission specific learning goals

- I can identify health problems as a result of consuming unhealthy food products available at school canteens/cafeterias.
- I can identify and describe the different nutrients, their function and their daily required quantity.
- I can read and understand the label of ingredients on food items.
- I can perform simple calculations and calculate the nutritional value of a certain quantity of a product.
- I can reflect on the concept of the food pyramid (old and new) and the different groups of food products.
- I can reflect on my own eating habits (health passport), the importance of a balanced diet and the long-term consequences when consuming unhealthy food.
- I can describe the nutritional needs of a person (e.g., proteins, carbohydrates, calcium, minerals, vitamins, etc.).
- I can explain the caloric needs of a person based on the basic energy requirements (BER) and the extra energy requirements (EER).
- I can describe the digestive system, its functions and processes.
- I can identify health issues and describe ways to combat/avoid them.

I can create a healthy pizza based on the information attained from the previous activities (optimization strategy).

Connection to the curriculum:

During the development of the mission, every effort has been made to ensure that the learning content and the pedagogical framework are relevant to the national science curricula of all SCY-partners. The topic of nutrition and health reveals a significant compatibility with various domains and learning goals across the national curricula of lower (and upper) secondary education. The science concepts that this mission brings forward are predominantly from the domain of biology and, to a lesser extent, the domain of chemistry. In addition, a small number of mathematical skills are being addressed during the mission.

Implementation of the Demonstrator:

1. Information (*Orientation and Asking Questions)*
   The mission begins with an introduction to the purpose and goals of the mission in which the teacher contextualizes the whole project by explaining the mission the students will engage in. Students receive new information on the topic by watching a video and reading a text, while taking notes and answering specific questions.
2. Conceptualization (*Orientation and Asking Questions)*
   Students try to identify the different concepts involved in the mission. Their efforts result in a theoretical model (e.g., a concept map) that links these elements together and serves as basis for generating hypotheses they could investigate. Students come back to refine their conceptual models in the course of the scenario.
3. Design *(Hypothesis generation and design)*
   Students design a physical or virtual artefact based on the conceptual model.
4. Build *(Planning and Investigation)*
   Students execute a design, working with given material to produce artefacts.
5. Experiment *(Planning and investigation)*

Students design and conduct experiments with the respective artefact(s) they have designed.

6. Evaluation *(Analysis and Interpretation)*
   Students evaluate the data collected against their hypotheses and use the outcomes of this comparison to refine their conceptual models and artefacts.
   - Reflection *(Conclusion and evaluation)*
     Students evaluate whether they reached the mission goals and learning goals, and explain reasons for possible deviations. They discuss how (or whether) the gradual increase in understanding caused them to modify project goals or if other factors such as time assigned, tools, limitations, and lack of good information led them to reconsider their ambitions. Students also reflect on their learning process and discuss what they would have done differently.

Domain:	**Big Idea of Science:**	**Age group:**	**Time needed:**
Biology, social science, home economics, Health education	7,8	15-18	The duration of the mission is approximately 20 hours, though depending on the level of detail put into the student work this may be done in more or less time.
Languages available:	**Equipment needed**	**Involved actors**	**Used eTool and link:**
English, greek	Computers, mobile phones to collect data.	The teacher and fellow learners	Scy pizza simulation, www.SCY-net.eu

Quality Characteristics of the Demonstrator

Characteristic I
how Demonstrator follows an **inquiry based approach**

This is clear from the learning activities outlined above.

Characteristic II
how Demonstrator integrates **eLearning element**

The main e-learning element is the pizza simulator, a tool that helps learners compute the nutritional value of the pizza they are designing. Moreover, there is the health passport that helps learners reflect on they own learning style

Characteristic III
how Demonstrator follows a **Big Idea of Science**

Addressing nutrition directly addresses the idea of the need for energy and materials by living organisms.

Characteristic IV
how Demonstrator is connected to a **real world problem**

Obesity and malnutrition are realistic real-world problems. In this demonstrator, children are made aware of these problems by looking at their own behaviour and by designing healthy food.

Experiences with the Demonstrator?

Yes,
from DIX.4: SCY Summative evaluation report
In the case of the healthy pizza mission used in Cyprus, the students managed to follow the predefined route of the mission as prescribed by the activity sequence. This mission had a clear sequence and was meant for and tested on younger students than the three others. Some divergence was identified in the two clusters of students. Nevertheless, the students managed to visit all the learning objects in the right order and complete the mission successfully. Each object produced is based on the information of the preceding objects . Hence, following the sequence of the creating the learning objects in the right order is vital for students' learning.