

# Roleplay Medical Imaging

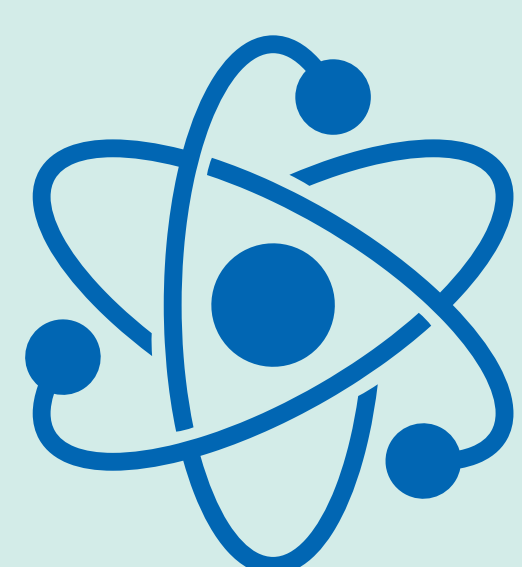


## Project goal: sharing nuclear knowledge with a new generation

The purpose of this teaching module is to impart the significance of radiological applications, demonstrated through collectively working on a practical example in the form of a challenge:

*“How many grams of Uranium needs to be radiated in the reactor to examine 20 patients with a SPECT-scan?”*

## Roleplay gives students a practical example of multidisciplinary collaboration:



### PHYSICIST

How long does it take until there is only 1% Mo left from the Mo-99 to Tc-99m decay?

$$N(t) = N_0 \left(\frac{1}{2}\right)^{\frac{t}{t_{1/2}}}$$



### PHYSICIAN

How much percent of the initial activity from Tc-99m is left after 1 day (24 hours)?

$$A(t) = A_0 \left(\frac{1}{2}\right)^{\frac{t}{t_{1/2}}}$$



### CHEMIST

How much NaOH do you minimally need to dissolve 5 grams of Mo-99?

The molar mass of MoO<sub>3</sub> is 144 g/mol and of NaOH 40 g/mol.



### EXPERT LOGISTICS AND SECURITY

Molybdenum is put in a container of lead. This container should stop at least 75% of the outgoing radiation. What should be the minimal thickness of the container?

$$I(d) = I_0 \left(\frac{1}{2}\right)^{\frac{d}{d_{1/2}}}$$

## Reception

Received well by teachers and students; still being downloaded and used in lessons.

Through feedback and popular demand, the second module Nuclear Energy (Module Kernenergie) is almost ready to be published.



## New module: Nuclear Energy

The purpose is to inform young students about different energy sources and to enable them to take part in the ongoing discussion surrounding the energy transition.

*They will collectively answer the question: How does nuclear energy fit in a fossil-free future?*



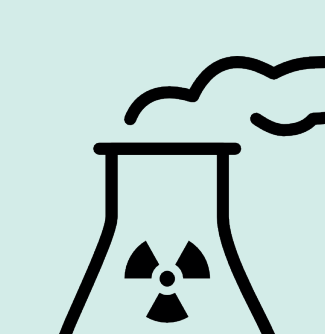
### ENERGY EXPERT

Researches electricity demand and production in the Netherlands and looks into fulfilling this demand with CO<sub>2</sub>-free electricity sources.



### ENVIRONMENTAL EXPERT

Compares the environmental impact of different electricity sources using the Life-cycle Assessment (LCA).



### SAFETY EXPERT

Learns about the safety features of a nuclear power plant and discusses the subject of risk perception.



ENERGY