

Iron & Alloys

A. Main topics

- The steel cycle from mining to the characterization and recycling.
- The toolkit meets the Critical Raw Materials when treats the iron metallurgy and the special steels.



B. Targeted audience

10-13 years old students

C. Key concepts

1. The simplest things in our pockets contain steel but people do not know how many process it undergoes before becoming something like a coin or a part of a mobile phone.

- Lecture

2. "Iron" is the trivial word that people use to indicate many alloys having different characteristics.

- a couple of simple experiments, one based on Archimedes' principle and one on magnetism, shows this differences.

3. The iron gives the name to an historical age, but it is also the material of the industrial revolution and also for architects' creativity. Some ideas for multidisciplinary insight are given.

4. Visits in local museums of science and technology, looking for iron manufactures, but also history and art are suggested.

D. Experimental activity :

Two experience can be performed in the classroom by the students themselves:

- semi-quantitative evaluation of the density of different steel alloys;
- to play with magnetic field with a magnet and steel powder.

E. Toolkit material

- Samples of pyrite, hematite, etc.; an object in cast iron and a steel, a magnet; a graduated cylinder plexiglass 250 or 500 mL, a rubber band and some toothpicks to make an experiment on the buoyant force that allows to discriminate between steel and cast iron.
- Protocol with the description of the experiments.
- Pedagogical dossier with explications, pictures, etc. that can be used by the teacher
- Multimedia tools (videos with processes that use the concepts seen during the experimentation)

F. RM Tutor

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