

# Secondary 2

## Areas



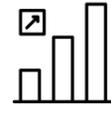
TECHNOLOGY



GEOGRAPHY  
AND HISTORY



BIOLOGY  
AND GEOLOGY



INITIATION INTO  
ENTREPRENEURIAL  
AND BUSINESS  
ACTIVITY



MATHEMATICS



PHYSICS

## Materials laboratory

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### Goals, opportunities, ideas and concepts



1. Understand the different materials used to make packaging (plastic, metal, cardboard, Brik cartons) and their characteristics and advantages..
2. Evaluate the functionality, ergonomics, eco-design and recyclability of a type of packaging.
3. Identify consumer patterns by family unit and consumer habits.

### Laboratory and materials

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#### ● The aim of this activity is...

Put into practice theoretical knowledge, develop the scientific method and learn to handle objects in the laboratory. Apply concepts of mathematics, physics and chemistry. Use instruments and units of measure. Draw conclusions and use critical thinking.

#### ● What do we need?

Packaging of all kinds (plastic bottles, yogurt pots or fruit containers, snack bags, cardboard boxes, paper flour or sugar bags, cardboard tubes, Brik cartons, food cans and soft-drink cans). All the packaging should be clean, without labels and without parts of another material. Laboratory instruments, overalls, gloves and safety glasses, containers, different chemical compositions, water, Bunsen burners, tongs and instruments for measuring and weighing, notebooks or tablets for taking notes, and a blackboard.



#### ● What will we do?

We will experiment with the characteristics of the packaging material in order to describe its advantages. We will form four groups: one for plastic, one for cardboard, one for Brik cartons and one for metal.

The plastic group will examine qualities such as malleability, ductility, impermeability, strength, acoustic, electrical and heat insulation, lightness and resistance to corrosion. The cardboard, metal and Brik cartons group will examine shock resistance and stacking cartons ability, airtightness watertightness, impermeability, rigidity, compression, etc.

Each group will write down the tests carried out and the results obtained. The last quarter hour will be used to draw conclusions and write them down. In another session, the groups will share their reflections and decide which materials are best suited for each type of product.

#### Shall we continue?

Look for videos with these experiments or other experiments that cannot be carried because they are difficult or dangerous. Different fun tests can also be included with soft-drink cans to determine their ability to contain liquids under pressure.

### Laboratory and materials

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#### ● The aim of this activity is...

See the practical application of the characteristics of the materials in the design and eco-design of packaging and how they adapt to suit the needs of the consumers.

#### ● What do we need?

Supermarket catalogues. Opinion surveys on consumption and recycling habits.

You can look for data on [www.ecoembes.com](http://www.ecoembes.com)

#### ● What will we do?

Each pupil must select a product from the catalogue, in different formats (milk in bottles and in Brik cartons, frankfurters in blister packs, jars and tins, etc.).

Each pupil must draw up a sheet explaining the reasons for choosing each type of packaging, its advantages and who it is most useful to.



#### Shall we continue?

Visit a supermarket as a group to discuss in situ, guided by the manager, how the products reach the store and what criteria are used to place them.