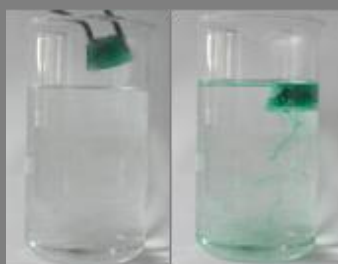




## PROFILES IBSE Teaching/Learning Materials for Students

compiled by the PROFILES Working Group of the Freie Universität Berlin – Germany



KieWi & Co. – Ways into the Microscopic World:  
“What happens to the ice cubes in my soft drink?”

A Module for Science Instruction –  
especially Chemistry – for Grades 5 to 7

Developed by: Sabine Streller, Claudia Benedict, Claus Bolte (2007)  
Institution: Department of Chemistry Education, Freie Universität Berlin – Germany  
Homepage: [www.chemie.fu-berlin.de/didaktik](http://www.chemie.fu-berlin.de/didaktik) - Mail: [didaktik@chemie.fu-berlin.de](mailto:didaktik@chemie.fu-berlin.de)

### Outline

In this PROFILES module “**What happens to the ice cubes in my soft drink?**” you will be confronted with an everyday phenomenon (an ice cube melting in a glass of fizzy drink) and are asked to observe and describe exactly what you see. You will be asked to voice your assumptions and suggest experiments with which to test those assumptions. Furthermore, you will be confronted with models to describe your experiments. The following worksheets will help you in working on the tasks.

### Acknowledgement:

These materials are taken from the Teaching-Learning Materials Tool compiled by the PARSEL Consortium (namely by Streller, Benedict, & Bolte, 2007) as part of the EC FP6 funded PARSEL Project (SAS6-CT-2006-042922-PARSEL) and adapted by the FUB-PROFILES Working Group – Member of the PROFILES Consortium. For further information see:

[www.parsel.eu](http://www.parsel.eu).



These worksheets belong to: .....

**KieWi&Co.: Ways into the Microscopic World**  
**“What happens to the ice cubes in my softdrink?”**

## 1. Water: A Matter of Change

An ice-cube is floating in a glass of coke or a glass of fizzy drink...

What will happen to the ice-cube now?

- Assumption(s): .....

• Design an experiment with which you can test your assumption(s).  
Find headings for the experiments.

Experiment 1: .....

Materials: .....

Procedure: .....

Diagram

Observation: .....

Interpretation: .....

My assumption was confirmed / not confirmed (Please delete as applicable)

- Conclusion and new question: .....



Professional Reflection-Oriented Focus on Inquiry-based Learning and Education through Science

If this experiment did not fulfil your expectations or you did not achieve the desired results, here is some room for a second experiment which will hopefully confirm your assumptions.

Experiment 2: .....

Materials: .....

.....

Procedure: .....

.....

.....

.....

Diagram

Observation: .....

Interpretation: .....

.....

My assumption was confirmed / not confirmed (Please delete as applicable)

Summary: .....

.....

.....

## 2. Other things that ice is involved in...

### Gritting the roads in winter

Ice melts when it's warm. But we can cool down ice and melt it at the same time!

### Ice skating

We can make a thread move through ice because ice also melts under pressure.

### Weathering

Ice can break rocks, and bottles too...



### 3. Why do ice cubes float on water?

If you put an ice cube into a glass of water, the ice cube will float on the surface. Is this true for all substances – that the solid state will float on its liquid state?

**Assumption:** .....

**Materials:** Hotplate, 200 ml beaker, some fat, knife

**Procedure:**

Place as much fat into the beaker that only a small amount remains. Stand the beaker on the hotplate and let the fat melt. When all the fat has melted, place the remaining piece of solid fat onto the liquid fat.

**Observation:** .....

**Explanation:** .....

.....

What is the difference between the system ice/water and the system solid fat/liquid fat?

**Assumption:** .....

.....

.....

**Materials:** 2 x 100 ml beakers, waterproof felt pen, water, vegetable oil.

**Procedure:** Fill one of the beakers 2/3 with water, the other one 2/3 with the vegetable oil. Mark the level of the liquids on the glass and put both beakers into a freezer for a few hours.

**Observation:** .....

.....

**Explanation:** .....

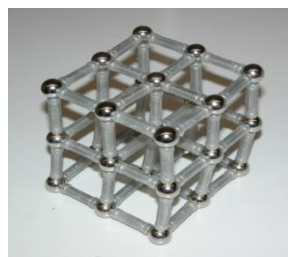
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## 4. Models

For us to be able to explain our observations in the experiments “What happens to an ice cube in a glass of coke?” and “Why does an ice cube float?” we used different models. But what exactly is a model?



When you hear the term “model”, you will probably think of model trains or model cars. These are simplified versions of actually existing objects. Only certain features of the model are the same as in reality. However, models can be simplified representations of conceptions or ideas as well.

**Task:** Try to build an “ice cube” model yourself.

**Materials:** Polystyrene, paper clips, fabric, plasticine, glue, paper, leftover plastic, cardboard, large bowls, water and other modelling tools.

**Procedure:** Choose the materials you will need and then build an “ice cube” model.

**Interpretation:** Now collect all the models and consider for each of them whether it is a simplified version of an actually existing object or a simplified representation of a conception or idea that can help you in explaining particular phenomena.