School Lessons with Pritt

These materials are part of the Researchers' World education initiative. The teaching concept and program were developed under the guidance of Prof. Dr. Katrin Sommer, Chair of Chemistry Didactics at Ruhr University Bochum, Germany, with the support of Henkel adhesive experts. The experiment is suitable for third or fourth grade students.

Lesson 7: Producing adhesives from food

Materials needed

- Food that becomes sticky when heated: chocolate, gummy bears or carrot juice
- 1-2 fire-resistant glass jars or cooking pans
- Hotplate, two-ring stove or oven
- 1-2 glass rods or spoons for stirring
- Construction paper, thin cardboard or other strong paper for the test strips

This lesson introduces the experience that everyday products – in particular food and beverages – demonstrate the phenomenon of "gluing". The aim is for the students to create their own adhesives using food. Food such as gummy bears, pudding powder, thin chocolate mints and carrot juice should be available for them to use.

The students have already gained the competence to produce a starch paste from potatoes, and this competence can now be applied to the example of pudding powder. Moreover, the students have learned from everyday life when food becomes sticky – when chocolate melts in the sun, for example. This phenomenon can be transferred to gummy bears and chocolate, with the result that carefully heating these foods produces functioning "adhesives."
This approach is supported by the tool of graduated learning aids, using a three-stage scale.

Part 1: Graduated learning aids

Gummy bear glue:

- When have you noticed that gummy bears become sticky?
- How can you turn gummy bears into a liquid?
- Heat 50 gummy bears in a pan until they have melted. Add some water to the melted gummy bears so that they are easy to spread.

Chocolate glue:

- What needs to happen to chocolate for it to melt?
- Melt the chocolate.
- Heat 100 g (4 oz.) of chocolate in a pan until it melts. Gradually add 10 ml (2 tablespoons) of water to the chocolate as it cools so that it remains thick and smooth.

Carrot glue:

- Carrots contain sugar.
- Take some carrot juice and think about how it could become sticky.
- Heat 100 ml (4 fl. oz.) of carrot juice in a pan on the hotplate at the highest setting until a sticky mixture is produced.

Glue made from thin chocolate mints:

- What needs to happen to chocolate for it to melt?
- Melt the chocolate.
- Heat 100 g (4 oz.) of thin chocolate mints in a pan until they melt. Gradually add 10 ml (2 tablespoons) of water to the mixture as it cools so that it remains thick and smooth.

Part 2: Making test strips

Just like real product developers, the students finally need to test how strong their adhesives are. To prepare for the test, the students should again make test strips at the end of the class.

Worksheets for students

Lesson 7: Producing adhesives from food

Can other food also be used to produce adhesives?

Various types of food can be used.

- Use your imagination to invent adhesives made from food.
- Write instructions for the experiment that will produce the adhesive you invented.

Use the food adhesives to produce test strips for the next class, and label them with your name and the adhesive used.