

Textilchemie auf Englisch

Eine bilinguale experimentelle und fächerübergreifende Unterrichtseinheit für die Sekundarstufe I

ISABEL FERNÁNDEZ – TORBEN LAROCQUE – MARTINA VON GEHLEN – ANNE-MARIE GRUNDMEIER

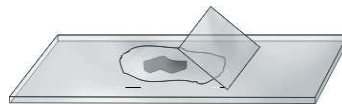
Online-Ergänzung

Station 1: Examination of natural and synthetic fibres

Materials:



microscopes



microscope slides with different fibres

Performing:

1. Every student has to take one microscope and one microscope slide (either a natural fibre or a synthetic fibre)
2. Adjust your microscope with the smallest optimal enlargement and then get more into detail.
3. Now examine your fibre under the microscope.
4. Draw the shape of your fibre on your worksheet.
5. Now take another fibre and do the same.
If you used a natural fibre in your first examination, please take a synthetic fibre now and vice-versa.
By the end you should have drawn one synthetic fibre and one natural fibre.
6. Clean your workplace.

Word Box

to adjust = einstellen

to examine = untersuchen

optimal enlargement = Vergrößerung

Station 1: Examination of natural and synthetic fibres

Tasks:

1. Draw your fibres on this worksheet and write down the optimal enlargement next to it.

Natural fibre



Synthetic fibre



2. What are the differences between these two fibres? Take notes.

Station 2: Water absorbency of shirts

Materials:

2 buckets



water



1 natural fibre shirt
(100% cotton)



scales



1 synthetic fibre shirt
(100% polyester)



1 hair-dryer



Performing:

1. Fill your 2 buckets halfway with water.
2. Now **weigh** your natural fibre shirt and your synthetic fibre shirt and write down your results.
3. Take your shirts and put each one in a bucket so that they get wet.
4. Now wait for 1 minute. While waiting write down your **hypothesis** on your worksheet.
5. Take your shirts out of the buckets and weigh them again. Write down your results.
6. Wring your shirts out. What do you notice?
7. Dry the shirts either with a hair dryer or outside. Take notes on how dry they are after 10 minutes and then 20 minutes and how long it takes until they are dry.
8. Clean your workplace.

Word Box

absorbency =
Saugfähigkeit

to weigh = wiegen

hypothesis =
Hypothese/Vermutung

Hypothesis:

What do you think will be the result of this experiment?

Write down your ideas before you do the experiment and complete the tasks.

Station 2: Water absorbency of shirts

Tasks: Now do the experiment.

1. Take notes on your observations.

2. Write down the weight of your shirts before and after the experiment. Calculate the percentage between both weights and after a drying process of 10 minutes and then 20 minutes.

	before (dry)	after (wet)	percentage
natural fibre shirt			
synthetic fibre shirt			

3. Write down how long it takes you to dry the different shirts.

	time
natural fibre shirt	
synthetic fibre shirt	

Conclusion:

1. Did your ideas at the beginning match your results?

2. In which situation could this liquid management be useful for people?

Station 3: Wind resistance of polyester textiles

Materials:

clear plastic pipe



tape



raincoat



T-Shirt fabric
(100% polyester)



hair-dryer



styrofoam bowls



tape measure



Word Box

hypothesis = Hypothese/Vermutung

styrofoam = Styropor

Performing:

1. *Person 1*: Take the plastic pipe and fasten one textile – raincoat or T-shirt – to one end of the pipe with help of the tape. Now fill the pipe with styrofoam bowls and fasten the second textile to the other end of the plastic pipe.
2. Write down your **hypothesis** before you go to the next step.
3. *Person 2*: Now take the hair-dryer and switch it on (low level).
4. Put it against the end of the plastic pipe.
5. *Person 3*: Measure how far the bowls will go up. Repeat this step 2 or 3 times.
6. *Person 4*: Write down your results.
7. Complete the tasks below.

Station 3: Wind resistance of polyester textiles

Hypothesis:

What do you think this experiment can show you?

Tasks:

1. Measurements:

Textile	cm	cm	cm
polyester raincoat			
polyester T-shirt			

2. Take notes of your observations.

3. Why do you think that some styrofoam bowls went up higher than others?

Conclusion:

1. In which situation could this property be useful for people?

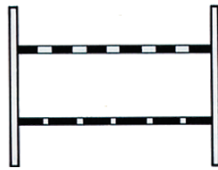
Station 4: Insulation quality: Which textiles keep you the warmest?

Materials:

3 test tubes



1 test tube rack



3 thermometers



3 plugs



tape



textile fabrics

hot water



kettle



Word Box

insulating quality = Isolierfähigkeit

hypothesis = Hypothese/Vermutung

Performing:

1. Heat up some water in the kettle. While the water is heating up please write down your **hypothesis** for this experiment.
2. Wrap the fabrics around the test tubes with tape.
3. Fill your test tube with hot water from the kettle until it reaches the top of your fabric.
4. Now push the thermometer through a plug and insert both in the test tube.
5. Read the thermometer and write down your results. (See table below.)
6. Clean your workplace.

Station 4: Insulation quality: Which textiles keep you the warmest?

Hypothesis:

What do you think which textile isolates the best and why?

Tasks:

Now you will read the temperature every minute for 8 minutes and write down the results in the table below.

time (minutes)	1	2	3	4	5	6	7	8
temperature thin cloth (°C)								
temperature felt (°C)								
temperature fleece (°C)								

Conclusion:

1. What are your findings? Which is the textile that isolates the most and which one the least?

2. In which situation could your results be important?

Station 5: Toxic chemicals in our shirts?

Warning: Football shirts of European Championship 2012 contain toxic chemicals

Currents news about Euro 2012 football shirts with toxic chemicals caused a scandal. Football fans could risk their health by wearing their favorite Euro 2012 team's shirt.

BEUC, who represents the EU's national consumer organization, orders to **banish** the football shirts of Euro 2012 co-host Poland that are claimed to be highly toxic.



Abbildung 1

Research **revealed** concerning levels of chemicals in the national shirts of Germany, Spain, Portugal, Poland, Ukraine, Italy, France, Russia and the Netherlands.

In six Euro shirts, from the countries Germany, Spain, Ukraine, Russia, Italy and France, the heavy metal lead was found.

Lead in German and Spanish kits even **transcended** the legal level for children's products, and Dutch and Portuguese Euro shirts contained nickel.

The BEUC comments: 'Host country Poland's shirt should be banned outright from shops as it contains an organotin compound, used to **prevent** sweat **odour**, in higher doses than the legal limit. Organotin can be toxic to the nervous system.'

Moreover, nonylphenol was found in Italian and Spanish football shirts. It describes a further chemical with harmful effects that was expelled from waste water.

Monique Goyens, director-general of BEUC, states: 'Football fans pay up to 90 euros (£73) for the shirt of their favourite team. The least they should expect is to have a quality and safe product. It is **inexplicable** that heavy metals are used in mass consumer products. It is clearly foul play by manufacturers to use substances harmful to both people and the environment. Our members' test results are a sad reminder that Europe's chemicals legislation is unfit for the purpose of banning dangerous substances from consumer products.' (Text in Anlehnung an: Euro 2012 football shirts contain toxic chemicals, warns health dog. By Sportsmail Reporter. Mail Online. 06.06.2012. <http://www.dailymail.co.uk/sport/euro2012/article-2155212/EURO-2012-Toxic-football-shirts.html>)

Station 5: Toxic chemicals in our shirts?

How can you get sure that your clothes do not contain toxic chemicals?

Watch out for this sign →



The OEKO-TEX® Standard 100 is an independent testing and certification system for textiles starting from **raw materials** through all stages of production and **ready-made** articles such as all types of clothing, **domestic and household textiles**, bed linens, **terry cloth** items, **textile toys** and more. The testing for harmful substances always focuses on the actual use of the textile. The more intensive the skin contact of a product is, the stricter the **human ecological requirements** are. (www.oeko-tex.com)

Word Box

to contain = beinhalten

BEUC = Europäische Verbraucher Organisation

to banish = verbannen

to reveal = aufdecken

to transcend = überschreiten

to prevent = vorbeugen

odour = Duft

inexplicable = unerklärlich

to accentuate = verschärfen

to require = fordern

raw materials = Rohstoffe

harmful substances = Schadstoffe

domestic and household textiles = Heim- und Haushaltstextilien (z. B. Vorhänge, Teppiche, Handtücher)

terry cloth item = Frottierwaren (z. B. Bademäntel)

textile toys = textiles Spielzeug

human ecological = humanökologisch (die Haut und den Körper des Menschen betreffend)

requirement = Forderung

Station 5: Toxic chemicals in our shirts?

Tasks:

1. Fill in the words:

lead, Germany, prevent, risk, banned, exceed, crime, safe, metals, chemicals

Official team jerseys of Poland, Spain, _____ and some other countries contain a high level of _____. According to some organizations these shirts should be _____ from stores because football fans can _____ their health. Another heavy metal, called _____, was found in six team jerseys. Especially childrens' products _____ the legal level. These chemicals are used to _____ sweat odour in high doses. These shirts cost about 90€ each, so that everybody should expect that they are buying a good and _____ product. Sadly, these heavy _____ are used in many mass consumer products all over the world. The EU should really do something about this form of _____.

2. True or false statements:

Tick off what you think is either true or false. Please correct the false statements with a correct sentence.

Statement	True	False
1. Shirts from Ireland contain nickel.		
2. These chemicals are used to prevent sweat odour		
3. A German jersey can risk your health.		
4. Lead, a heavy metal, was found in jerseys of 10 countries.		
5. Germany and Spain are not allowed to take part in the World Cup 2014 because of their illegal shirts.		

Station 6: What kind of shopper are you?

Task:

1. Read the text on your own!

The stylish jeans, the cool shirt or the newest sneakers - teenagers are a particular and attractive target group for the fashion trade. The reason is simple: They have money and they want to spend it. They have needs to be satisfied and are interested in new things. Currently, teenagers between ten and nineteen have an available spending power of around 22 million Euros. This conforms to the gross domestic product of countries like El Salvador or Cameroon.



Quelle: Lorelyn Medina – fotolia.com

Abb. 1

Teenagers are today's consumers. Economy, trade and marketing strategists have adapted themselves to it. They offer numerous products specifically for teenagers. Through their socialization they prefer different brands, something that often extends into their adulthood. Parents, friends and the media have the greatest influence on teenagers.

Admen and marketing strategists divide teenagers into different consumer types to address them purposefully. This test will show you what kind of shopper you are.

Word Box

spending power = Kaufkraft

gross domestic product =
Bruttoinlandsprodukt

trade = Handel

admen = Werbefachleute

purposefully = zielgerichtet

2. Please tick off the fields that correspond to you!

	I disagree 1	I agree a bit 2	Undecided 3	I agree partly 4	I agree completely 5
When I buy clothes I look for specific brands because I want to fit in.					
Buying and shopping are not really necessary but they are a hobby. That is why I also buy things when I don't really need them.					
When I go shopping, I often spend more money than I actually wanted.					
When I go shopping I do not care about the price. I buy whatever I like.					
Washing and cleaning on my own? When I go shopping I do not pay attention to the care instructions in the clothing.					
Test seal, quality seal and environment seal do not affect my purchasing decisions.					
Comparing prices is for boring people. I buy straight away so that nobody else can take it from me.					
When I see a piece of clothing or accessories on my favourite celebrity that I like I need to have it as well.					
I am not interested in the conditions in which garments are produced. The main issue is that it is cheap no matter how much money I have available.					
I am very interested in what other people like. That is why I read a lot of fashion and lifestyle magazines.					

Word Box

seal = Siegel

to swap = tauschen

to evaluate = auswerten

the bargain hunter = Der Schnäppchenjäger

the conscientious shopper = Der überlegte Käufer

the impulsive shopper = Der impulsive Käufer

Word Box

name brand shopper = Marken-Shopper

to give yourself a treat = sich etwas Gutes tun

victim = Opfer

conscience = Bewusstsein

consideration = Berücksichtigung

purchase = Anschaffung, Kauf

whim = Laune

3. Swap your questionnaire with the one of your partner. Now you evaluate each other. You add up the points as follows:

“I disagree”:	1 point
“I agree a bit”:	2 points
“Undecided”:	3 points
“I agree partly”:	4 points
“I agree completely”:	5 points

Until 15 points: The bargain hunter

You have the talent to become a finance minister because you pay attention to every single penny. You are everything but not a fashion victim. Most of the time you are calm and you decide rationally. When you give yourself a treat then it is only because you really thought about the object of dreams for a very long time or because the price was low. Nevertheless you should learn to treat yourself once in a while and also pay attention to care instructions, test seal and quality seal. Then you can go shopping with a good **conscience**.

16 – 20 points: The conscientious shopper

You are very reasonable and you spend as well as save. Before you buy something you think carefully if you can afford it and you compare prices. That is why your purchasing decisions are generally well thought out. Not the brand but quality and care instructions are important to you. Clothes worn by film or TV celebrities or even your friends are not significant to you. Keep using your head and take your time with purchasing decisions and you will buy high quality and sustainable items for people, nature, environment and your purse.

21 – 30 points: The impulsive shopper

You buy something because you have fun doing it or because you want to cheer yourself up. No matter if it is cheap or expensive, with high wearing comfort or not when you like something you cannot control yourself and you buy it. Then you do not care about care instructions or the product’s label. Take your time to consider the pros and cons before you buy something. This saves you from an empty purse and buying something too soon. Watch out for the quality of your clothing and keep an eye on the washing and test labels.

31 points or more: The name brand shopper

The cool sneakers, the stylish designer jeans or the trendy shirt you saw in a magazine – you fulfill your every whim straight away. Your idols are celebrities from TV and movies. You read fashion and lifestyle magazines weekly. Shopping is your favorite hobby. You care a lot about what other people think about you. That is why you pay a lot of attention to your clothes and spend more money than you have. If you continue like this, you will be in debt sooner than you think. Sleep on major purchases. You have to pay attention to the quality seal as well as to the price tag.

4. Compare your results with your group and speak about them. Which shopping type appears the most in your group and why?

Sämtliche hier verwendeten Texte wurden in Anlehnung an folgende Quelle erstellt und aus dem Deutschen übersetzt:
Stiftung Jugend und Bildung (Hrsg.): Stoffwechsel. Textilien und Textilwirtschaft im Wandel. Wiesbaden 2011. http://www.jugend-und-bildung.de/files/860/AB_Stoffwechsel_09_2011_V2.pdf