

## 2.5 Chromatography

<p><b>Basic information and collecting ideas</b></p> 	<p>Chromatography comes from Greek and means “colour writing”. Chromatography is used in science as a method for separating mixtures and for detecting substances. During the production of drugs negative substances are separated from positive ones, and in the field of forensics offenders can be convicted on the basis of detected substances.</p> <p>In sports, athletes can be tested for doping using chromatography on a urine sample.</p> <p>An advantage for the school: The principle of the chromatography can be carried out with a few water-soluble fibre pens and simple kitchen paper.</p>
<p><b>Setting up and conducting experiments</b></p> 	<p>Please use water-soluble pens and allow students to try different coloured fibre pens. Some colours will not split, while others will show different colours.</p>
<p><b>Observing and documenting</b></p> 	<p>The example of the black colour shows that several single colours are included, which absorb all spectral colours (rainbow colours) of sunlight. No colour is reflected.</p>
<p><b>Analysing and reflecting</b></p> 	<p>The separation principle: The molecules of different single colours can move at different speeds because of their size or binding forces to paper or water.</p>
<p><b>Doing further research</b></p> 	<ol style="list-style-type: none"> <li>1. Use a different black pen and repeat the procedure. Is there a difference? Explain.  <i>&gt; Students can recognize that a black colour is composed of different individual colours. Different pens show different single colours which can be used like a “fingerprint”.</i> </li> <li>2. A contract was changed with a second black pen. How can you probably prove this manipulation through chromatography?  <i>&gt; If the number “10” is changed to “100” with another black pen, the manipulation can be detected through chromatography: The second zero will show a different colour composition. Similarly, for example illegal substances in the urine of athletes who dope are discovered when the chromatogram of the urine has similarities with that of doping substances.</i> </li> </ol>

