Ämnesprov, läsår 2015/2016

Chemistry

Årskurs

Delprov A1

engelsk version

Elevens namn och klass/grupp

Prov som återanvänds av Skolverket omfattas av sekretess enligt **17 kap. 4 § offentlighets- och sekretesslagen**. Detta prov återanvänds av Skolverket t.o.m. **2022-06-30**.



NATIONAL TEST IN CHEMISTRY 2016

The national test gives you a chance to show what you know about chemistry. On the right of each question you will find a symbol that tells you which of three abilities you can demonstrate in your answer.

The rows in the symbol describe these different abilities.



The ability to use knowledge of chemistry to examine information, communicate and take a view on questions concerning energy, the environment, health and society

The ability to carry out systematic investigation in chemistry

The ability to use concepts of chemistry, its models and theories to describe and explain chemical relationships in society, nature and in people

For each row you will be able to show your knowledge at three different levels: E, C and A.

For example, the table on the right indicates that the question allows you to show that you can use concepts of chemistry, its models and theories to describe and explain chemical relationships in society, nature and in people at level E and C.

Your answers to the questions should be clearly written so that other persons can read your text and understand your meaning. Therefore it is important that you show all your work.

Time allowed: 75 minutes

Name:	

 School:
 Class:

 Date of Birth: Year
 Month

 Day

Your answers must be written on separate sheets of paper, NOT on the question paper. The question paper must be returned to your teacher together with your answers.

1. The picture shows a chemical reaction between Compound 1 and Compound 2.



Which of the alternatives **A–D** is best describing what is produced in the reaction between Compound 1 and Compound 2?

2. Eutrophication is an environmental problem resulting in for example to lakes' enhanced growth.

Which of the alternatives A–D is best describing a reason for eutrophication?

- A. Discharge of oil from boats.
- **B.** Discharge of nutrients from fields.
- C. Discharge of sulphur dioxide from industries.
- **D.** Discharge of carbon dioxide from cars.

3. Each and every of the discoveries can be combined with one of the descriptions and with one of the areas of application.

A correct combination is: 1:B:X. Combine the others.



4. During elk hunting, bullets of lead can be used. The National Food Agency has found that people eating a lot of elk meat have a higher amount of lead in their bodies than the rest of the population. Therefore, the National Food Agency has recommended that you should not eat the meat closest to where the bullet got stuck.

Explain why the National Food Agency recommends that you should not eat the meat closest to where the bullet got stuck.



5. The human use of fossil fuels is contributing to the release of carbon dioxide into the atmosphere. Some of the carbon dioxide is thereafter dissolved in the seas affecting the pH through a chemical reaction.

Carbon dioxide molecules + Water molecules \rightarrow Hydrogen ions + Carbonate ions

How is the pH of the seas affected by the reaction? Explain why.

- **6.** When algae grow, chemical energy is generated for example in the form of dextrose and vegetable oil.
 - a) State in what way the sun's beams of light contribute to the production of chemical energy in the algae.

A paper mill in Sweden wants to decrease its emissions of carbon dioxide and nutrients. They decide to grow algae that use carbon dioxide and nutrients for a living.



The vegetable oil extracted from the algae will be used as engine fuel. This production and application can give both positive and negative consequences for the environment.

b) Reason in two steps about two consequences on the environment from the production or application of vegetable oil.

7. In a bathroom, water is running in two water pipes, one with cold water and one with hot water. When Olle is done showering, he finds small drops of water on one of the pipes. He checks if the pipe is leaking, but it does not.



Use knowledge about phase changes and the movement of particles to explain why small drops of water are produced on one of the water pipes.

8. In the body, there are molecules called enzymes. Enzymes are affecting chemical reactions in the body. For example, there are enzymes in the intestines affecting milk sugar (lactose).

Explain how enzymes affect chemical reactions.



9. Through the ages, the structure of the atom has been described with different models.



a) Compare the three atom models. State one similarity and one difference between them.

In school, Bohr's atomic model is most often used to describe chemical compounds, for example water and sodium chloride (salt).

- b) Explain how Bohr's atomic model can be used to decide an element's possibility to react and produce a chemical compound.
- **10.** Around the world, mining waste is handled in different ways. In Asia, some people make a living on extracting copper from the waste from the mining companies. The waste is put in buckets with water. Thereafter, empty soft drink cans of aluminium are put into the buckets. Then a chemical reaction happens, where copper ions from the waste turn into copper metal.

The metals in the box are ordered according to their nobility.



Explain how copper ions from the mining waste turn into copper metal through the reaction with aluminium metal.





Institutionen för tillämpad utbildningsvetenskap