

Chemistry

Delprov A1

engelsk version

Årskurs

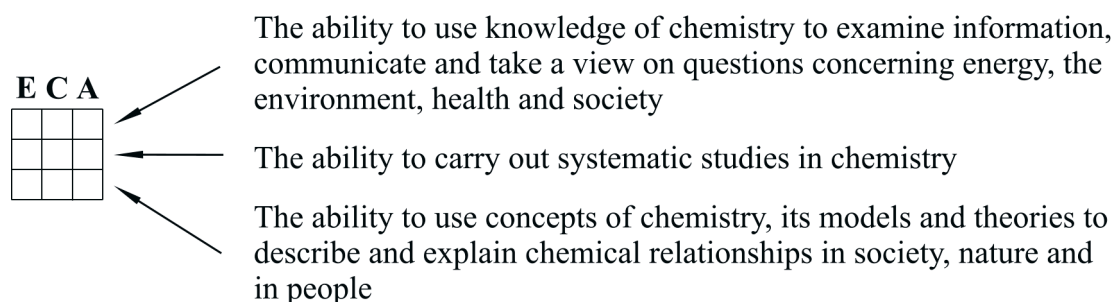
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Elevens namn och klass/grupp

NATIONAL TEST IN CHEMISTRY 2015

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.



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: _____

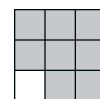
Date of Birth: Year _____ Month _____ Day _____

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. Charcoal consists mainly of carbon atoms and hydrogen atoms.



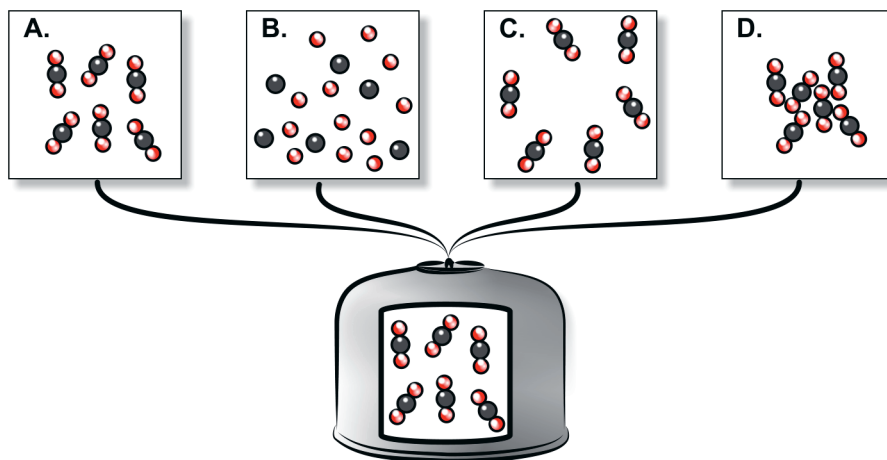
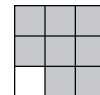
Which one alternative **A – D** best describes what happens with the carbon atoms and hydrogen atoms in combustion?



- A.** The atoms react with carbon dioxide and form water and oxygen.
- B.** The atoms react with oxygen and form carbon dioxide and water.
- C.** The atoms react with water and form oxygen and nitrogen.
- D.** The atoms react with nitrogen and form carbon dioxide and water.

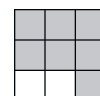
2. A gas cylinder is filled with carbon dioxide. The carbon dioxide is in liquid form because the pressure in the gas cylinder is high.

Which one picture **A – D** best describes what happens with the carbon dioxide molecules when they are released from the gas cylinder?

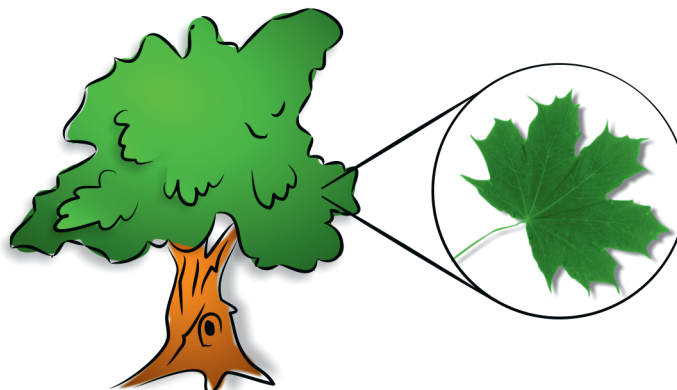


Gas cylinder filled with carbon dioxide

3. Use knowledge of the atom to explain what is meant by saying that gold is a resistant metal, in other words, a noble metal.



4. Photosynthesis is a chemical reaction which takes place, for example, in the green leaves of plants.



- a) Match the four substances **A – D** to the right alternatives **1 – 2**.



A. Carbon dioxide

B. Oxygen

C. Glucose

D. Water

1. Substances that react in photosynthesis.

2. Substances that are formed in photosynthesis.

- b) When the substances involved in photosynthesis react, an energy transformation takes place.

Which one alternative **A – D** describes how the chemical energy is affected in that reaction?



A. The chemical energy decreases in the reaction.

B. The chemical energy disappears in the reaction.

C. The chemical energy increases in the reaction.

D. The chemical energy neither decreases nor increases in the reaction.

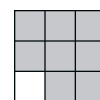
- c) Use knowledge of energy transformations to explain why the alternative you chose in task 4 b) is the correct one.





5. Colours that were used before in tattoos contained lead ions. Such colours are now forbidden because they can give rise to allergies and other diseases. When tattoos with these colours fade, diseases can arise in other parts of the body than where the tattoo is.



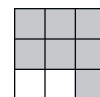
Describe why diseases can arise in other parts of the body than where the tattoo is.



6. Naima has received a mixture of methanol and ethanol from her teacher. Her task is to separate the two substances. Since the substances have different boiling points, Naima chooses to boil the mixture in order to separate the substances.

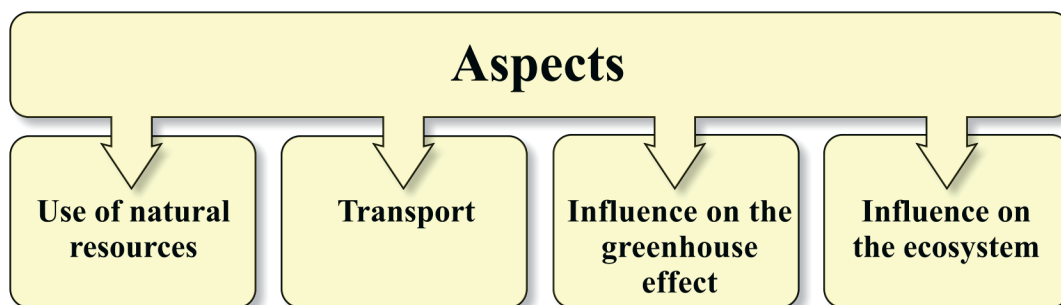
Substance	Boiling point (°C)	Molecular models
Methanol	65°C	
Ethanol	79°C	

Explain why methanol and ethanol have different boiling points.

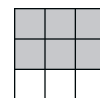


7. When the supply of crude oil decreases, the possibility of producing for example gasoline is more and more limited. This increases the need for other fuels for our cars. One such fuel is ethanol. Ethanol can be produced from for example different grains, sugar cane, rice and waste materials from forestry.

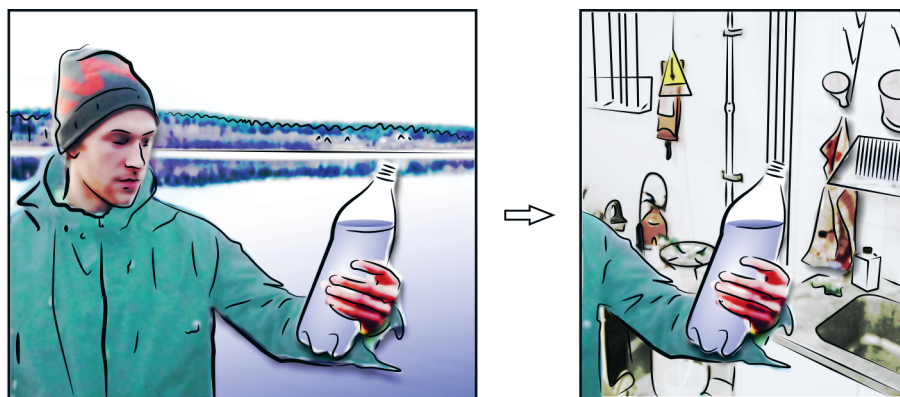
Imagine that all the cars in the world would run on ethanol instead of gasoline. The change of fuel might, from different aspects, have environmental consequences.



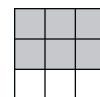
Use **the different aspects** as a starting point and discuss what positive **and** negative consequences the change of fuel from gasoline to ethanol could have for the environment.



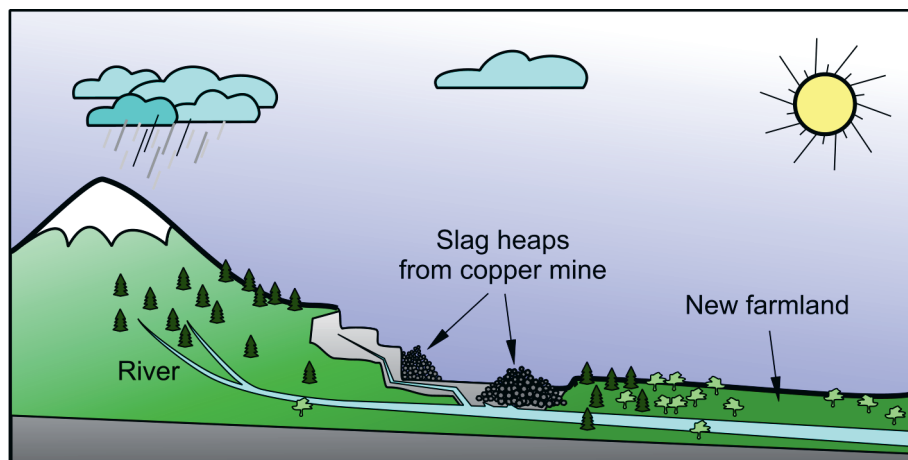
8. Simon fetches water from a lake nearby. The water is muddy. Simon wants to remove the mud from the water, and then purify it further to make it drinkable.



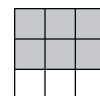
Explain how Simon can first remove the mud from the water, **and** how he can purify the water further to make it drinkable.



9. In many places in Sweden, there are abandoned mines. The picture shows the area surrounding a copper mine that was closed many years ago.



Taking the picture as a starting point, use knowledge of the properties of water to give reasons why the new farmland is not suitable for farming.



10. Nanotechnology deals with changing substances at the atomic level, to give materials new properties and uses.

The texts below are examples of how nanotechnology is used in different areas.

Super steel

Nanotechnology is used to make strong steel that doesn't break easily. This steel is used for example in very thin needles used in eye surgery.

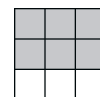
Stain resistant materials

Stain resistant fabric is made with the help of nanotechnology. The molecules are ordered in such a way that drops of liquid do not easily penetrate the fabric.

Microchips

Nanotechnology is used to construct smaller and faster microchips. Microchips are used in electronic appliances, like mobile phones.

Use **one** of the three examples as a starting point and explain how the use of nanotechnology can affect the living conditions of humans. State both an opportunity **and** a risk in your explanation.





Institutionen för tillämpad utbildningsvetenskap