

# Physics

## Delprov A1

engelsk version

Årskurs

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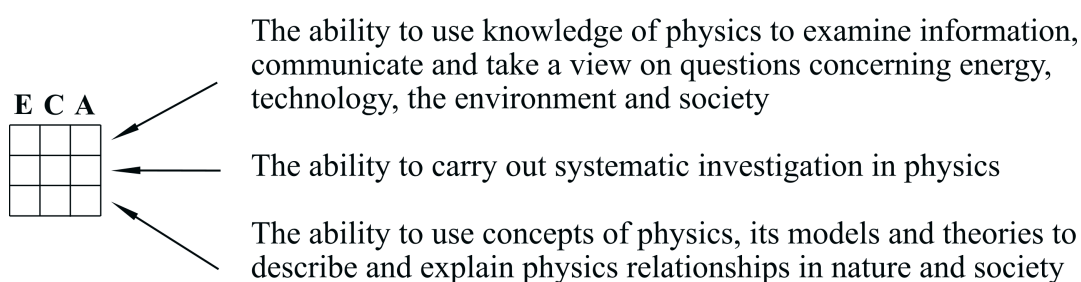
Elevens namn och klass/grupp



## NATIONAL TEST IN PHYSICS 2016

The national test gives you a chance to show what you know about physics. 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 physics, its models and theories to describe and explain physics relationships in nature and society 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: \_\_\_\_\_

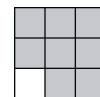
School: \_\_\_\_\_ Class: \_\_\_\_\_

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.*

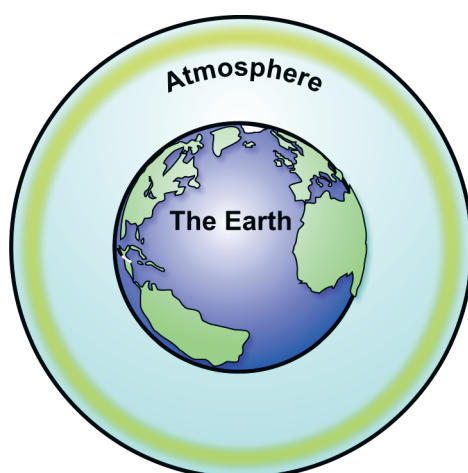


1. Rank the astronomical objects **A–D** regarding their size. Start with the smallest object.

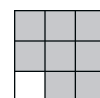


- A.** The sun
- B.** The Earth
- C.** Galaxy
- D.** Meteoroid

2. The Intergovernmental Panel on Climate Change (IPCC) claims that the greenhouse effect increases on the Earth.



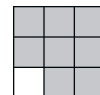
State one reason to the increasing greenhouse effect.



3. At holidays, for example New Year's Eve, it is common to release sky lanterns into the air.

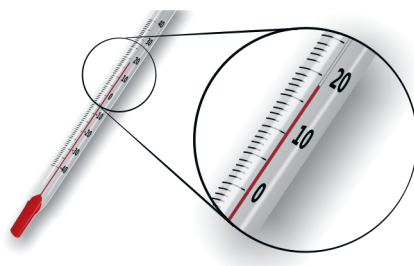


Which of the alternatives **A–D** is best describing why a sky lantern filled with hot air rises when it is released?

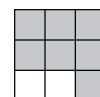


- A.** The gravity decreases when the air is heated.
- B.** The gravity increases when the air is heated.
- C.** Hot air has a lower density than cold air.
- D.** Hot air has a higher density than cold air.

4. A company is going to produce a thermometer with a thin cylinder filled with a liquid in colour. The thermometer will be sold in Sweden and it must work outside throughout the entire year.



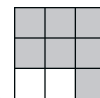
Start from the information in the table and explain why the company shall choose to use ethanol instead of pentane or glycol as liquid in the thermometer.



Liquid	Melting point (°C)	Boiling point (°C)
Pentane	- 130 °C	36 °C
Ethanol	-117 °C	79 °C
Glycol	-13 °C	197 °C

5. Four of the alternatives **A–H** is best describing the composition and development of the universe.

Choose one option from every box.



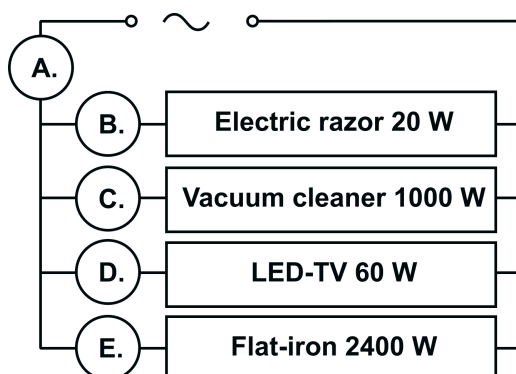
Box 1 { **A.** During Big Bang, matter was mainly transformed into energy.  
**B.** During Big Bang, energy was mainly transformed into matter.

Box 2 { **C.** The universe is expanding, getting larger.  
**D.** The size of the universe is constant.

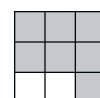
Box 3 { **E.** Our solar system was formed through Big Bang.  
**F.** Our solar system was formed billion of years after Big Bang.

Box 4 { **G.** In a star, the atom nuclei are combined and energy is emitted as heat and light.  
**H.** In a star, the atom nuclei are split and energy is emitted as heat and light.

6. The picture shows an electric circuit with four plugged devices. The devices have different power. The power is given in the unit of watt (W). In the circuit is a fuse that breaks the flow of current if an electrical fault occurs.



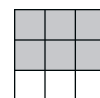
In which of the positions **A–E** should a fuse be placed for the electric circuit to be broken if there is an electric defect in one of the devices? Explain why.





7. One day when it is raining at the same time as the sun is shining a rainbow occurred.

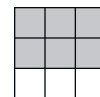
Use knowledge about light to explain how a rainbow emerges.



8. A ship runs between seas with different salinity. Depending on salinity in different seas a different amount of cargo can be shipped.



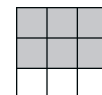
Use knowledge about the density and lift of water to explain how the seas' different salinity affects how much cargo that can be shipped.



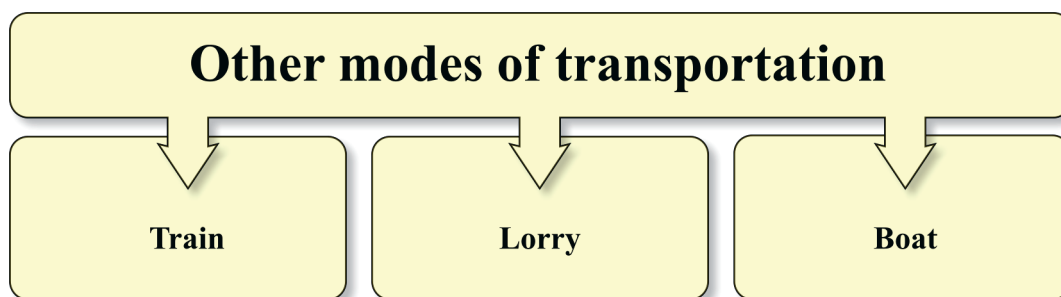
9. When it is raining, a lot of water is collected at the carriageway. If so, a car can start skimming over water, which makes it impossible to steer.



Give example of one reason to aquaplaning and explain what happens between tires and carriageway.

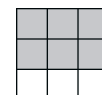


10. Many different products from all over the world are imported into Sweden. The products are transported to Sweden in different ways, for example by airplane. Transports with airplanes are affecting the environment in a negative way.

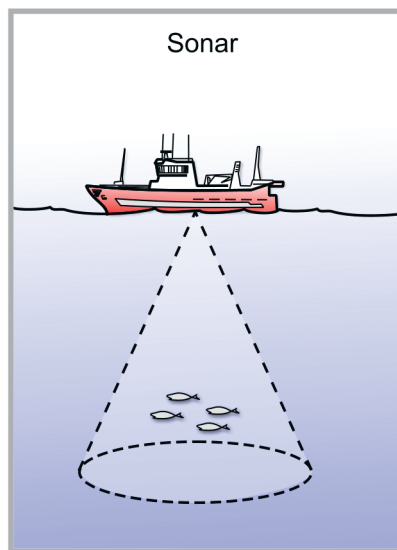
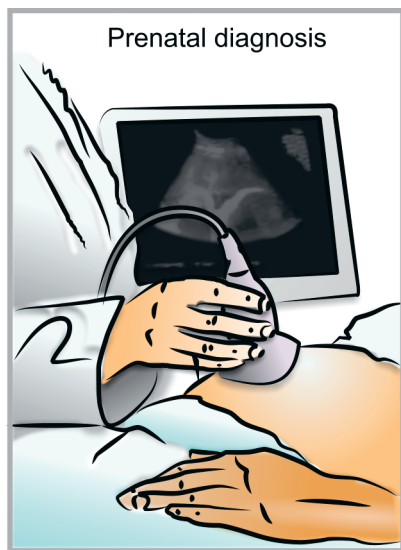


Let's say that products should be transported to Sweden by train, lorry or boat instead of by airplane.

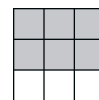
Choose one of the transportations train, lorry or boat. Reason in two steps, regarding two consequences on the environment, from changing ways of transportation.



11. Ultra sound is sound with a frequency higher than 20 000 Hz. Humans cannot register ultra sound, but it is still possible to apply for different purposes. Ultra sound can for example be used for prenatal diagnosis and sonars.



- Use one of the two examples and mention one possibility and one risk when using ultra sound.
- Explain in what way the possibility and the risk may affect the living conditions for humans.





Institutionen för tillämpad utbildningsvetenskap