

Physics

Delprov A1

engelsk version

Årskurs

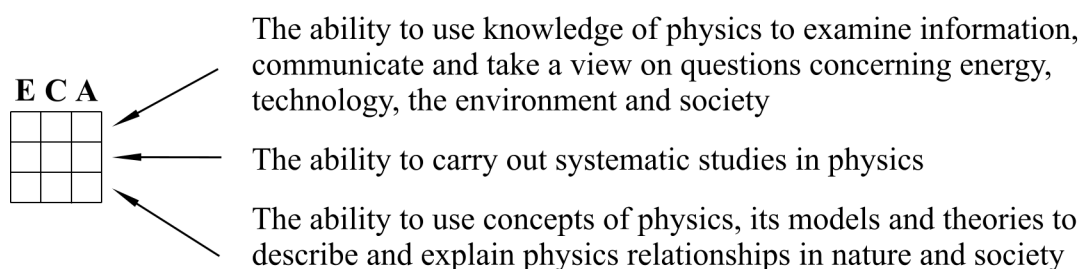
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Elevens namn och klass/grupp

NATIONAL TEST IN PHYSICS 2014

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 _____
 Girl ☐ Boy ☐

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. Research indicates that the universe was formed approximately 13,7 billion years ago.

What is the name of this formation of the universe?



2. In the weather forecast, the weatherman Lisa uses many different concepts. One of these concepts is high pressure.

- a) Which of the alternatives **A-E** is best describing the weather on a Swedish summer day with high pressure?



- A.** Clear skies and warm
- B.** Cloudy and cold
- C.** Rainy and warm
- D.** Windy and cold
- E.** Windless and cold

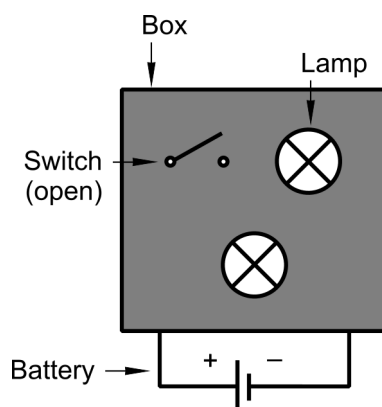
The weatherman Lisa says in her weather forecast that it will be windy since a high pressure and a low pressure collide.



- b) Will the winds blow towards the high pressure or towards the low pressure? Motivate why.



3. The picture presents a box from above. In the box there is a connected circuit. When the switch is open, only one lamp is shining. When the switch is closed, both lamps are then shining as strong as the one in the beginning when the switch was open.



Draw a circuit diagram showing the connected circuit in the box where the two lamps, the battery and the switch is presented.



4. Radioactive compounds can emit different kinds of radiation, for instance gamma ray.

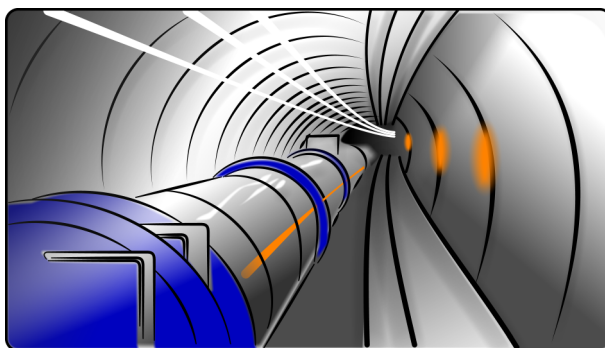
a) Explain how gamma ray emerges.



b) Describe the properties of gamma ray.



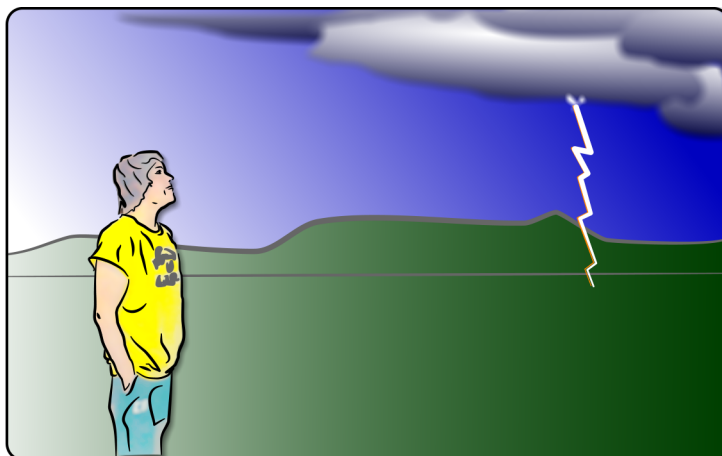
5. Researchers at CERN have found a particle called Higgs particle. It has given the researchers more information about the universe. To find Higgs particle, a 27 kilometre long tube was used where particles were accelerated to almost the speed of light.



To accelerate particles to a speed close to the light, vacuum is demanded in the tube. Explain why.



6. Thunder is a common weather phenomenon during summer. When warm and moist air is rising and cools down, thunderclouds can generate.



- a) Use content knowledge about the speed of sound and light to explain how you can decide how far away a lightning is.
- b) Explain how lightning emerges.



7. Give **one** example of a renewable energy source and reason about positive **and** negative consequences on the environment when using this renewable energy source.



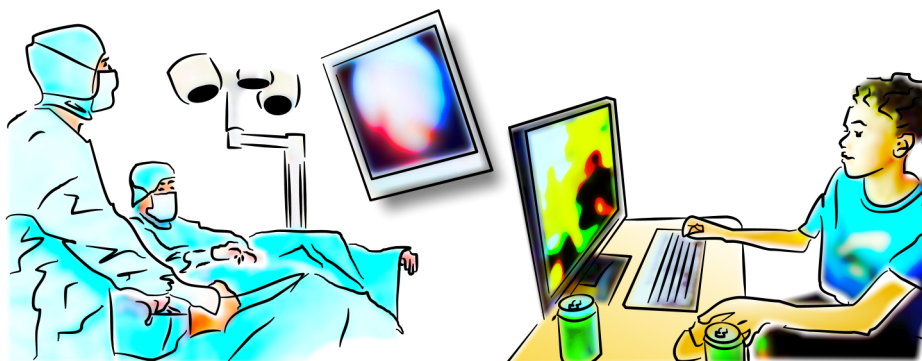
8. Total reflection of light is used to transfer information using optical fibres.

- a) Which of the alternatives **A-D** is best describing total reflection of light in an optical fibre?



- A. At total reflection, the light is refracted into one point and then follows the fibre.
- B. At total reflection, the light is bent and then follows the fibre.
- C. At total reflection, the light bounces towards the inside of the fibre and then follows the fibre.
- D. At total reflection, the light is absorbed on the inside of the fibre and then follows the fibre.

Optical fibres are used for instance within data communication and when examining patients within health care.



- b) Explain, with **one** example, how the use of optical fibres has an impact on people's living conditions.



9. Klara is going to eat a grilled sandwich. The bread and the tomato have the same temperature when Klara eats her grilled sandwich. Klara burns on the tomato but not on the bread. Explain why.





Institutionen för tillämpad utbildningsvetenskap