

JAF02 Unit 8 Physics education

Task 1 Speaking

Can you recall the process of choosing physics as your major? What were the key factors influencing your decision?

Task 2 Problem solving

Physics is in some surveys identified as the least popular subject at Czech school. In groups, discuss reasons why and suggest steps to rectify the situation.

Task 3 Listening – Open letter to the President: Physics Education

Watch the video and answer the questions below.

(<http://www.youtube.com/watch?v=BGL22PTIOAM>)

1. Why is it suggested Barack Obama doesn't know much about physics?
2. What are some of the topics students at American high schools do not deal with?
3. What is the parallel between physics and history, biology and geology teaching?
4. What did the word "computer" refer to in 1865?
5. Why is the "letter" addressed to Barack Obama?
6. What is the expected response of the secretary of education?
7. What do Carl Sagan, Richard Feynman and Neil de Grasse Tyson have in common?
8. What will happen if up-to-date science is not included in the curriculum?
9. What about math?
10. Why should latest scientific findings be taught at high schools?

Task 4 Reading

Why don't more girls study physics? Summarise the points of the four speakers.

(<http://www.guardian.co.uk/education/2012/dec/30/why-dont-girls-study-physics>)

1. "It might be that the problem is embedded in the ethos of the school and that teachers are tending to interact more with boys who are more outgoing. There are all sorts of subtle messages that 'Girls don't do physics'."
2. "The lifestyle of a research scientist is very flexible and in that respect it can be really good for women who have other responsibilities, like childcare. There's been a lot of encouragement and funding to get more women in, and once you're in there's no discrimination. In fact, there's lots of encouragement. Maybe at lunchtime you're hanging out with a load of guys talking about computer games, but that's about it."
3. "There are some very well-established women in science now who will still say they are in the minority at conferences, and they feel uncomfortable going to the pub, as the men do, to network after a talk."
4. The eminent astrophysicist Jocelyn Bell Burnell made one of the most important discoveries of the 20th century when she uncovered the existence of pulsars. And she recalled in a recent radio interview that the subsequent press interest was focused on "how tall I was, and, you know, chest, waist and hip measurements, please, and all that kind of thing. They did not know what to do with a young female scientist ... you were a young female, you were page three, you weren't a scientist."

Task 5 Reported speech

When the situation described in the *that-clause* is a PERMANENT situation, or still exists or is relevant at the time we are reporting it then we use a present tense (or present perfect).

- Dr Weir **thinks** that he **spends** about 5 minutes on a typical consultation with a patient.
- Australian scientists **claim** that they **have developed** a way of producing more accurate weather forecasts.
- Jill **says** that Colin **has been found** safe and well.

When we use a past tense in the *reporting clause* we can use either a present or past tense (or present perfect or past perfect) in the *that-clause*. Choosing a present tense in the *that-clause* emphasises that the situation being reported still exists or is still relevant when we report it.

- She **argued** that Carl **is/was** the best person for the job.
- He **said** that he **is/was** living in Oslo.
- I **told** Rosa that I **don't/didn't like** going to parties.
- They **noted** that the rate of inflation **has/had slowed** down.

When the situation described in the *that-clause* is in the past when we are reporting it, we use a past tense (simple past, past continuous, etc.):

- I don't want anything to eat. – Mark said he **didn't want** anything to eat.
- I'm leaving. – Bob announced that he **was leaving**.
- The problem is being dealt with by the manager. – She told me that the problem **was being dealt with** by the manager.

When the situation described in the *that-clause* was already in the past when it was spoken about originally, we usually use the past perfect to report it, although the past simple can often be used instead:

- I posted the letter yesterday. – She reassured me that she **had posted/posted** the letter the previous day.
- I've been spending a lot more time with my children. – He mentioned that he **had been spending** a lot more time with his children.

When there is a modal verb in the original statement, this sometimes changes when we report what was said.

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|----------------|-----------------|-------------------------|
| • Will – would | • May – might | • Must – must or had to |
| • Can – could | • Shall – would | |

Questions become statements.

- "Where have you been?" he said. - He asked me where I had been.
- "What time did it start?" he said. - He wanted to know what time it had started.
- "Why won't he do it?" she said. - She wondered why he wouldn't do it.

In yes/no questions we use *if* or *whether* in questions. *If* is more common and *whether* is more formal.

- "Will you come?" she asked me. - She asked me *if/whether* I would come.

The commands, requests and advice mostly have the same form in English: verb + object + infinitive (*advise, ask, beg, forbid, order, persuade, recommend, tell, urge, warn* etc.).

- "Get up!" - He told me to get up.
 - "Don't hesitate." - He persuaded me not to hesitate.
 - "Don't smoke." - The doctor warned my father not to smoke.
- (adapted from Hewings, M. (1999). *Advanced Grammar in Use*. CUP)

Exercise 1

Complete the sentences to report what was said.

1. "There are no easy solutions in energy conservation." - *Scientists often comment that*
2. "Too much strong coffee is bad for you." - *Most doctors agree ...*
3. "I am pregnant." - *At the meeting yesterday Mary announced ...*
4. "John left here an hour ago." - *She told me ...*
5. "You must collect more data." - *He told me ...*
6. "Pam visited us yesterday." - *She told me ...*
7. "Tom is looking for a new job." - *She told me ...*
8. "Who shall I deliver the parcel to?" - *He asked who ...*
9. "I can show you the way." - *He said ...*
10. "I will pay tomorrow." - *She said ...*
11. "It's too late." - *She said ...*
12. "I haven't finished it yet." - *I explained that ...*
13. "Claire must rest." - *The doctor said ...*

Exercise 2

Change the quotes into reported speech.

It's not that I'm so smart, it's just that I stay with problems longer. (Albert Einstein)

I was born not knowing and have had only a little time to change that here and there. (Richard Feynman)

In 1947 I defended my thesis on nuclear physics, and in 1948 I was included in a group of research scientists whose task was to develop nuclear weapons. (Andrei Sakharov)

(http://www.brainyquote.com/quotes/type/type_physicist.html)

Exercise 3 Indirect questions.

Complete the sentences. Then transform them into indirect speech – She asked...

1. Why did she cry? - I don't really know _____ .
2. Does she speak Greek? - I will ask her _____ .
3. Where is Joe? - I have no idea _____ .
4. I'd like to know what time _____. - The show starts at 8 o'clock.
5. Is he all right? - I do not know _____ .
6. What did he want? - I'm afraid I can't tell you _____ .
7. Do you know who _____? - Yes, Jim Harrison is a writer.
8. Whose car was it? - I'm not quite sure _____ .
9. Is this the right train? - Let's ask someone _____ .
10. Can you tell me what _____? - Her name is Maggie.

(Ex. 1 and 3 adapted from <http://www.e-grammar.org>)