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Do today's 15-year-olds feel environmentally responsible?

- Most 15-year-olds in OECD countries have some understanding of environmental issues and feel that threats to the environment are a serious concern for them and/or for other people in their country.
- Scientific understanding of the environment is key if students are to have a realistic appreciation of environmental challenges facing humanity. Students without sufficient knowledge of science consistently underestimate the time needed to find solutions to such environmental problems as what to do with nuclear waste or how to stop the loss of plant and animal species.

Knowledge and scientific understanding of the environment can help to instill a sense of responsibility towards the environment. But if young people cannot make the link between what they learn in school and the environmental challenges that surround them in real life, or if they have unrealistically high or low expectations of meeting those challenges, then they might not be able to fully capitalise on their academic training in these topics. Education – and parents – can help students to make those connections and develop realistic attitudes towards solutions.

Understanding and a sense of responsibility go hand in hand.

The PISA 2006 survey tested students on their scientific understanding of environmental issues and asked them – and, in some countries, their

parents – about their attitudes towards environmental issues. Students were asked whether they were familiar with the issues of air pollution, energy shortages, extinction of plant and animal species, clearing of forests for other land use, water shortages, and nuclear waste. In addition, students and parents were asked whether they believed that those issues represent a serious concern for themselves or others in their country, and how optimistic they were that solutions would be found to improve the situation over the next 20 years.

The vast majority of 15-year-old students reported they know or have learned something about environmental issues. On average across OECD countries, fewer than 3% of students reported that they are not sure what "air pollution" or "extinction of plants and animals" is; only around 5% reported not being sure what "water shortages" and "clearing of forests for other land use" is; fewer than 10% weren't sure what "energy shortages" were; and 11% were not sure what was meant by "nuclear waste".

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Learning in school influences attitudes outside of school

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Percentage of students ho believe the following environmental issues are of serious concern to themselves or other people in their country		Air pollution	Energy shortages	Extinction of plants and animals	Clearing of forests for other land use	Water shortages	Nuclear waste	Change in science performance that is related to a greater sense of responsibility for the environment Change in PISA score -10 -5 0 5 10 15
0	Australia	88	81	85	87	92	75	
OECD	Austria	95	78	87	82	68	71	
0	Belgium	95	80	82	76	68	83	
	Canada	93	80	85	89	76	79	
	Czech Republic	98	77	84	85	66	85	
	Denmark	86	75	78	78	67	73	
	Finland	88	67	74	76	45	74	
	France	95	80	82	81	78	84	
	Germany	94	86	87	84	74	85	
	Greece	96	88	86	84	87	80	
	Hungary	97	93	94	91	87	84	
	Iceland	84	62	69	67	49	52	
	Ireland	89	79	74	75	67	74	
	Italy	97	86	79	78	80	72	
	Japan	95	92	92	92	86	88	
	Korea	98	97	93	93	97	89	
	Luxembourg	92	78	81	78	73	74	
	Mexico	97	89	95	94	96	84	
	Netherlands	93	83	85	75	66	82	
	New Zealand	82	84	82	81	80	60	
	Norway	83	64	78	74	55	66	
	Poland	93	89	83	88	87	72	
	Portugal	97	94	94	95	96	83	
	Slovak Republic	97	86	90	83	83	80	
	Spain	97	94	95	93	95	88	
	Sweden	83	67	76	74	52	74	
	Switzerland	93	75	84	80	66	78	
	Turkey	97	94	94	95	92	92	
	United Kingdom	89	84	77	74	76	79	
	United States	91	84	85	87	81	83	
	OECD average	92	82	84	83	76	78	
Partners	Argentina	97	91	91	90	92	84	
rt.	Azerbaijan	95	89	86	84	88	79	
Pa	Brazil	97 97	91	93 91	93 92	92	87	
	Bulgaria Chile	97 98	91 96	91 95	92 94	91 95	86 85	
	Colombia	94	95	93	94	95	85	
	Croatia	96	92	93	94 91	90	87	
	Estonia	96	86	88	91	75	69	
	Hong Kong-China	95	86	81	75	78	61	
	Indonesia	95	93	90	91	92	75	
	Israel	92	83	86	80	91	73	
	Jordan	94	90	84	83	92	70	
	Kyrgyzstan	87	83	82	80	81	75	
	Latvia	94	82	77	87	75	75	
	Liechtenstein	93	72	86	79	60	69	
	Lithuania	96	87	91	91	80	83	
	Macao-China	93	87	81	81	88	63	
	Montenegro	95	89	88	86	89	77	
	Qatar	91	82	77	70	83	69	
	Romania	88	81	83	84	82	75	
	Russian Federation	95	91	92	93	90	89	
	Serbia	95	91	88	89	92	81	
	Slovenia	94	86	89	86	86	84	
	Chinese Taipei	95	94	91	92	94	91	
	Thailand	93	91	88	86	91	73	
	Tunisia	92	83	75	76	87	56	
				91	91	91	75	

Note: Changes in science performance that are statistically significant are indicated in a dark tone The change in science performance shows the change in the score on the PISA science test that is associated with a one-unit change in the index of students' responsibility for environmental issues, after accounting for students' and schools' background. Source: OECD (2009), *Creen at Fifteen? How 15-Year-Olds Perform in Environmental Science and*

Geoscience in PISA 2006, Table A3.14.

StatLink and http://dx.doi.org/10.1787/562200685357

Across OECD countries, a substantial proportion of students reported feeling a strong sense of personal and social responsibility towards these environmental issues - i.e. they reported that environmental issues are a serious concern for themselves and/or for other people in their country. For example, on average across OECD countries, 92% of students believe that air pollution represents a serious concern for themselves or others in their country, and over 80% of students feel the same about energy shortages, the extinction of plants and animals, and the clearing of forests. Some 78% and 76% of students, respectively, feel the same about water shortages and nuclear waste.

But optimism about the future of the environment is in short supply...

Students are not optimistic that the threats to the environment will be significantly reduced over the next 20 years. For example, on average across OECD countries, only 15% or fewer of students believe that there will be improvements with respect to nuclear waste, the extinction of plants and animals, and the clearing of forests for other land use; 16% of students feel the same about air pollution, only 18% are optimistic about tackling water shortages, and 21% feel the same about energy shortages.

Schools appear to play a central role as a source of knowledge about environmental issues. Fifteen-year-olds who participated in PISA reported that they mainly learn about the environment at school. On average across OECD countries, 58% of students reported that schools are their main source of information on nuclear waste issues, and 59% reported the same with respect to water shortage issues.



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Optimistic about the environment?

Around 60% of students reported that schools are their main source of information about energy shortages; 65% reported that schools are their main source of information on clearing of forests for other land use; 70% reported the same for the issue of extinction of plants and animals; and 76% reported that schools are their main source of information on air pollution.

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While students acquire knowledge about the environment at school, families also play a key role in forming students' attitudes and opinions about environmental issues, which, in turn, can shape students' willingness to adopt environmentally responsible behaviours later on. Students often share their parents' sense of responsibility and optimism towards the environment, although the strength of this correlation varies across countries and is stronger when it comes to feelings of optimism than with a sense of personal responsibility. Students and their parents in Turkey and the partner country Colombia, for example, responded similarly to the question of whether environmental conditions will improve over the next two decades, while a similarity between students and their parents in response to this question was less evident in Denmark, Germany, Iceland, Korea, Luxembourg and New Zealand. Students and parents in Turkey and the partner country Colombia also tended to agree that most of these environmental issues are of serious concern to themselves and/or to others in their country; in Denmark, Iceland and Luxembourg, students and their parents often had different responses to this statement.

Percentage of students ho believe that solutions to these environmental problems will be found over the next 20 years		Air pollution	Energy shortages	Extinction of plants and animals	Clearing of forests for other land use	Water shortages	Nuclear waste	Change in science performance that is related to greater optimism about environmental issues Change in PISA score -25 -20 -15 -10 -5 0
Q	Australia	14	21	12	11	18	12	
OECD	Austria	10	16	7	5	10	8	
	Belgium	12	14	10	11	13	14	
	Canada	13	17	10	10	12	13	
	Czech Republic	17	33	13	11	20	14	
	Denmark Finland	13 9	19 14	10	10	16 16	15 8	
	France	9	14	11 12	6 12	13	0 14	
	Germany	14	16	8	7	13	13	
	Greece	19	26	14	14	21	15	
	Hungary	13	13	12	12	18	13	
	Iceland	13	21	13	11	20	20	
	Ireland	20	26	16	15	27	17	
	Italy	14	18	14	12	17	16	
	Japan	20	22	16	16	20	17	
	Korea	29	49	22	29	23	32	
	Luxembourg	13	15	10	8	11	10	
	Mexico	17	12	20	17	16	10	
	Netherlands	18	19	13	15	23	17	
	New Zealand	10	20	12	8	14	10	
	Norway	30	33	19	15	28	25	
	Poland	22	18	20	17	18	23	
	Portugal	18	18	16	15	14	15	
	Slovak Republic	11	25	12	9	19	11	
	Spain	17	28	19 14	15	24	15	
	Sweden Switzerland	19 12	25 17	14	12 8	25 13	23 11	
	Turkey	23	23	18	0 18	22	16	
	United Kingdom	17	18	13	13	22	13	
	United States	21	26	18	15	22	17	
	OECD average	16	21	14	13	18	15	
s	Argentina	22	28	22	18	24	16	
Partners	Azerbaijan	37	42	32	43	43	26	
art	Brazil	21	23	22	18	20	18	
	Bulgaria	39	41	30	32	43	32	
	Chile	22	33	22	19	31	14	
	Colombia	28	38	28	23	30	19	
	Croatia	13	21	13	12	12	12	
	Estonia	12	21	13	11	20	17	
	Hong Kong-China	23	24	23	18	27	20	
	Indonesia	24	30	20	16	27	16	
	Israel	30	33 31	27 26	23 25	40 32	21 21	
	Jordan Kyrgyzstan	36 36	44	37	40	32 45	31	
	Kyrgyzstan Latvia	15	34	15	10	24	16	
	Liechtenstein	12	16	7	6	8	7	
	Lithuania	19	32	17	16	26	17	
	Macao-China	28	26	26	25	27	21	
	Montenegro	30	37	30	28	41	23	
	Qatar	44	41	36	36	45	30	
	Romania	33	33	22	24	35	23	
	Russian Federation	26	45	25	20	37	25	
	Serbia	24	32	23	21	31	18	
	Slovenia	12	20	11	10	12	12	
	Chinese Taipei	19	18	21	21	19	16	
	Thailand	32	36	28	34	41	25	
	Tunisia	31	29	30	28	32	20	
	Uruguay	21	18	20	17	21	12	

Note: Changes in science performance that are statistically significant are indicated in a dark tone. The change in science performance shows the change in the score on the PISA science test that is associated with a one-unit change in the index of students' optimism about environmental issues, after accounting for students' and schools' background. Source: OECD (2009), Green at Fifteen? How 15-Year-Olds Perform in Environmental Science and

Geoscience in PISA 2006, Table A3.14.

StatLink and http://dx.doi.org/10.1787/562200685357

...and is often associated with poorer performance in environmental science.

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PISA 2006 also found that there was no strong association between students' performance in environmental science and their sense of responsibility towards the environment when comparing students from similar backgrounds who attend similar schools. However, the extent to which students feel optimistic that solutions to environmental problems will be found over the next 20 years was negatively related to student performance in environmental science: the lower their scores in environmental science, the more optimistic students were that the situation will improve over the next two decades. This may be due to the fact that students who lack a deep understanding about environmental issues may be more optimistic, or that students who are optimistic about the future of the environment have less incentive to become more knowledgeable about environmental science.



Students largely share their parents' sense of responsibility towards the environment and their optimism about solving environmental problems

Note: Countries are ranked in descending order of the size of the correlation coefficient, which is a measure of the degree to which students and parents share similar attitudes. Correlation coefficients are calculated at the student level. Source: OECD (2009), *Green at Fifteer? How 15Year-Olds Perform in Environmental Science and Geoscience in PISA 2006*, Table A.3.7. **StatLink Science 1**, (dx.doi.org/10.1787/562200685357

The bottom line: Making the link between environmental science studies at school and how they apply to the "real world" can help to foster a sense of responsibility towards the environment. But undue optimism – or pessimism – about the environment may stymie students from using their knowledge and understanding to positive effect.

For more information

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See Green at Fifteen? How 15-year-olds Perform in Environmental Science and Geoscience in PISA 2006, OECD Publishing.

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