



# Education **now...**

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ADDING UP THE COST



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EducationNow's special report into future education costs for a child born this year.

SHARK STALKER



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A marine biologist's quest to track the movement of sharks in South Australian waters.

NEW KID ON THE SCHOOL BLOCK



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Education Minister Jay Weatherill's pledge to our state's schools and students.

# Please Minister, what's going on?

CANDICE KELLER  
EDUCATION REPORTER

**S**OUTH Australia is lagging behind other states in tackling the proposed teachers' boycott of next month's national literacy and numeracy tests, with no resolution reached between the State Government and the union.

Parents say they are being "left in the dark" about how NAPLAN tests will be administered - if at all - in the wake of the Australian Education Union's boycott of the assessment.

Teachers in NSW, Queensland and Western Australia are facing fines and other penalties from the Industrial Relations Commission if they go ahead with strike action.

The federal Fair Work Ombudsman also has asked union branches in Victoria, the ACT and Northern Territory to provide documents outlining the action planned for the days of the testing, May 11 to 13.

However, SA Education Minister Jay Weatherill has held off making a firm decision on the issue.

The South Australian Association of State School Organisations, the state's peak parent body, has received numerous phone calls from concerned and confused parents.

SAASSO director David Knuckey said parents weren't hearing anything "concrete" about how the testing would be completed.

"Parent confusion will soon turn to frustration if they don't get a clear answer about the tests," Mr Knuckey said.

"Parents will be dismayed if NAPLAN deteriorates into another union/State Government stand-off, with their children again caught in the middle.

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## World first all about middle years

EDUCATORS: Lauren Mazzarolo and Emily Johnson are the first in the world to graduate from a tertiary course for teachers based on the International Baccalaureate Middle Years Program. THE FULL STORY on Page 61

# 'Connect to the vibe of the city.'

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## News in brief

### ENVIRONMENTAL SLANT



STUDENTS were pulling apart Playstations these school holidays instead of playing with them.

Learning how to dissect the popular games console to recover its recyclable parts was one of many activities held as part of a free interactive treasure hunt around Adelaide city, run by the South Australian Chamber of Mines and Energy.

This year's event had an environmental flavour in celebration of the United Nation declaring 2010 the Year of Biodiversity.

Students were able to explore the water, land, air, waste and energy of the city to learn how they are managed in the resources industry.

GHD, one of the world's leading engineering, architectural and environmental consulting firms, opened its doors to more than 100 primary students to share their knowledge of sustainability.

Students, including Michael, 9, his brother Matthew, 8, and Hailey, 8, all pictured above, took part in several interactive experiments involving recycling, solar power and electricity.

### VIDEO PROJECTS ON THE GO

CLASSROOMS are being turned into film sets across the country, in preparation for the 2010 Panasonic Kids' Witness News short video competition.

KWN is for primary and secondary school students and aims to inspire creativity and encourage teamwork in the classroom.

This year, 10 SA schools will be among more than 60 from across Australia taking part in the program, with students writing, directing, shooting and starring in their very own short, five-minute video.

More than 630 schools in 24 countries will participate in this year's program. The KWN New Vision Awards will be held in Sydney in October. **Go to:** [www.panasonic.com.au/kwn/schools.cfm](http://www.panasonic.com.au/kwn/schools.cfm)

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Published by The Advertiser  
Newspapers,  
31 Waymouth St, Adelaide, SA  
5000.  
GPO Box 339 Adelaide, SA 5001.



# CAN YOU BELIEVE IT?

WITH NATALIE WILLIAMSON, UNIVERSITY OF ADELAIDE

## How H<sub>2</sub>O goes with the floe when forming ice



### DID YOU KNOW

- More than 96 per cent of the world's water is found in the oceans.
- Water boils at 100C and freezes at 0C.
- Water is the only substance whose solid form (ice) is less dense than its liquid form.
- Water molecules interact with each other through a special force called hydrogen bonding.

**GIANT ICE CUBE:** Seagulls perch on an iceberg floating in a fjord near Ilulissat in Greenland.

Picture: MICHAEL KAPPELER/AFP

**Y**OU'VE poured yourself a drink of water and you drop in an ice cube to keep it cold. What happens? The ice cube floats, of course. But have you ever stopped to think about why?

Water is one of the most amazing substances on earth, but because it surrounds us in so many ways, we rarely think about it in this light.

Water is a small molecule made up of only three atoms, one of oxygen and two of hydrogen. Small molecules are usually gases. Carbon dioxide, another molecule made up of just three atoms, is a gas at room temperature. By rights, a small molecule such as water should be a gas at room temperature too.

However, we know that water is a liquid that boils at 100C and freezes at 0C. Both of these temperatures are unusually high for a molecule of water's size. So why does water break the mould in this way?

The answer lies in a special type of interaction between water molecules.

Attractive forces are responsible for holding atoms together within a molecule and also for holding molecules together in a pure sample of the substance.

The forces holding atoms together are called

intramolecular forces and the forces holding molecules together are called intermolecular forces. The weaker the intermolecular forces holding molecules together, the more likely the substance will be a gas. The stronger the intermolecular forces, the more likely the substance will be a liquid or a solid.

The intermolecular forces holding water molecules together are very strong and result from an attraction between an oxygen atom within one water molecule and one of the hydrogen atoms in another water molecule.

This kind of interaction is called a hydrogen bond, and is the strongest intermolecular force known.

Only certain types of molecules can hydrogen bond. Water contains an oxygen atom joined directly to a hydrogen atom, which is one of the requirements.

Carbon dioxide contains oxygen atoms too, but because there are no hydrogen atoms attached to them, it cannot hydrogen bond.

This means that the intermolecular forces holding carbon dioxide molecules together are relatively weak, and so it is a gas. The ability of water to hydrogen bond gives rise to its relatively high melting and boiling points.

So how do intermolecular forces explain

why ice floats? If something floats, it is because its density is lower than that of the liquid it is floating in. Density is a measure of how much mass of a substance is present in a specific volume. Water is one of only a few substances whose solid form is less dense than its liquid form.

Within liquid water, hydrogen bonds are constantly being made and broken between different molecules.

The water molecules are free to move around and are able to be in fairly close proximity to each other.

When water is cooled, the breaking and reforming of hydrogen bonds slows down to a point where each water molecule settles into one specific spot where its movement is limited.

This optimises the formation of hydrogen bonds and results in an open, rigid arrangement of water molecules with more space between them. As a consequence, solid water (ice) has a lower density than that of the liquid, which is why, when you drop that ice cube into your glass of water, the ice floats.

**Dr Natalie Williamson is a lecturer in chemistry at the University of Adelaide's School of Chemistry and Physics**

## Please Minister, what's going on?

### From Page 25

"These tests provide direct feedback to parents on their child's development; parents should know what exactly is transpiring and they are also entitled to be heard on the issue."

The AEU is opposed to results of the test being used to "name and shame" schools and teachers on the Federal Government's controversial school performance website, MySchool.

Federal Education Minister Julia Gillard has failed to meet with the AEU executive to resolve the conflict and has left it to state jurisdictions to handle the delivery of the tests.

Last week, Mr Weatherill wrote to school principals to gain a picture of how they would

be affected by the strike. Now he is being called on to act.

A spokeswoman for Mr Weatherill said he would meet with the Industrial Relations Commission tomorrow, but it was unlikely formal action would be taken.

"It's early days in the process of resolving this issue and responses from SA principals suggest that about half of the state's schools will need some additional support to run the NAPLAN tests," the spokeswoman said.

"The department is working on contingency planning to make sure the tests will go ahead in all schools."

Mr Weatherill has indicated those contingency plans would not include calling on parents to supervise the test, which Ms Gillard

suggested could be one solution to overcome the strikes. Arranging relief teachers is the most likely solution.

State shadow education spokesman David Pisoni said schools and parents were entitled to a resolution as soon as possible.

"The proposed NAPLAN ban by the union and the new minister's dithering is causing concern amongst parents that next months tests will not go ahead," Mr Pisoni said.

SA Secondary Principals Association president Jim Davies said principals were caught between a "rock and a hard place" in regards to the boycott. "Many principals are torn between being respectful of their union colleagues, but at the same time they have a job to do as school leaders," he said.