

# GAME CHANGER



## The Australian STEM Video Game Challenge

By Chris Rosicka

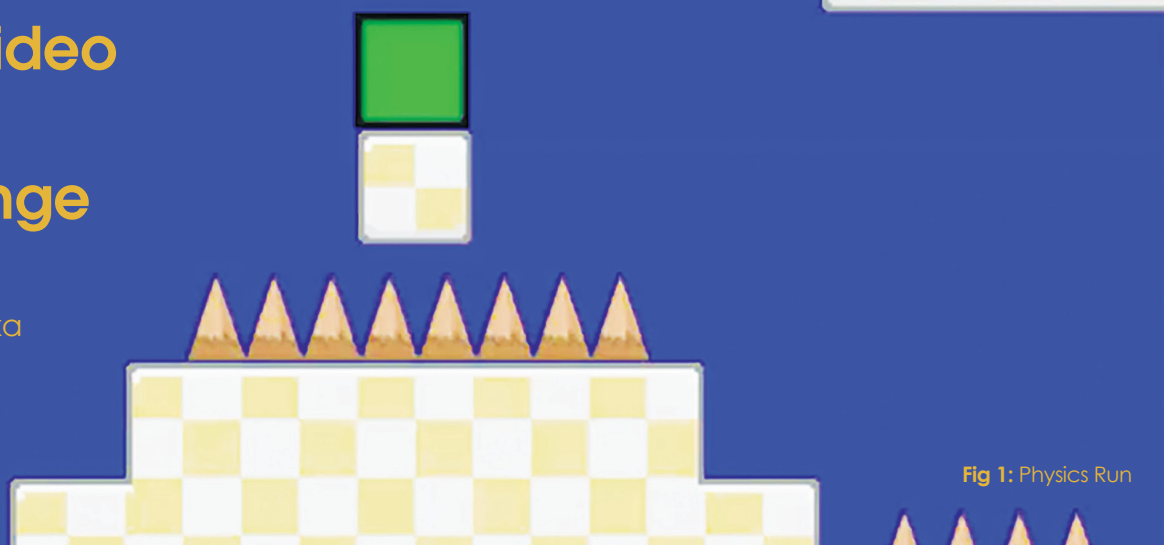


Fig 1: Physics Run

**The Australian STEM Video Game Challenge aims to increase interest and participation in the science, technology, engineering and mathematics (STEM) disciplines by inviting school students in Years 5 to 12 to create an original video game based on STEM themes.**

*\* All images are screenshots of winning 2014 game entries*

Run by the Australian Council for Educational Research (ACER) with the support of PricewaterhouseCoopers Australia (PwC), government, universities, the gaming community and corporate partners, the Australian STEM Video Game Challenge was inspired by the National STEM Video Game Challenge in the United States.

The inaugural Australian Challenge attracted registrations from 550 students from 144 schools across the country. Winning students were presented with their awards and prizes of a HP Laptop and \$1,000 for their school at a panel discussion and awards ceremony at PAX in Melbourne in late 2014.

### THE GOAL OF THE GAME

While the need for STEM experts is growing, the number of students studying STEM disciplines in senior secondary school has been declining in Australia, according to the Office of the Chief Scientist, leading to fewer students pursuing post-secondary study in STEM fields. The low number of female students studying STEM is also a

concern. An OECD report published in February 2014 notes that, across all OECD countries, an average of 14 percent of women are enrolled in STEM-related courses in the higher education sector, compared to 39 percent for men.

There is a need to find ways to encourage and engage students to study STEM. To this end, the Australian STEM Video Game Challenge was established by ACER with a view to encouraging students to develop an interest in study and employment in STEM fields. The Challenge invites students to create, not just play, games. It is designed to develop skills and engagement with STEM through fun, creativity, problem-solving and ingenuity. The Challenge also aims to encourage participation with key groups, particularly disadvantaged students and females who, according to Careers Australia, are traditionally under-represented in STEM studies and careers. Around one quarter of the 2014 registrations for the Australian STEM Video Game Challenge were from females. We are hoping to increase this rate in coming years.

## GAME ON: WHAT DO STUDENTS NEED TO DO?

All Australian students in Years 5 to 12 are eligible to enter, either as individuals or as part of a group of up to four. Students have about four months to design and build their games. There were several platforms students used in 2014, all of which are free and easily available online. These included the following:

- Gamestar Mechanic
- Gamemaker
- Construct 2
- MIT Scratch
- Stencyl
- Love2D
- X Code 6
- Unity
- Unreal
- Python and Pygame

The Challenge caters for students with different levels of coding or game development skills. Students with less

experience in coding or developing games are able to use simple platforms, with drag-and-drop interfaces, to learn and develop skills throughout the process. More experienced students are able to challenge themselves and utilise platforms that rely more heavily on code or script to develop their game.

## CURRICULUM LINKS

Depending on the theme of the game, links can be made with science, technology, engineering or mathematics. However, in developing their game, students use aspects of various subjects across the Australian Curriculum.

One 2014 winner aimed at a younger audience, 'Evolution Maze', explored how species evolve over time and become more resistant to predators and other threats. This links with Years 5 and 6—*Biological sciences: Living things have structural features and adaptations that help them to survive in their environment* (ACSSU043).

'Smog Game' dealt with the effects of pollution and the impact of reducing pollution. This links with Year 7—*Science as a Human Endeavour: Science understanding influences the development of practices in areas of human activity such as industry, agriculture and marine and terrestrial resource management* (ACSHE121).

There are also numerous ways that the Challenge relates to Digital Technologies Processes and Production Skill learning outcomes such as:

- Years 5 and 6—*Implement digital solutions as simple visual programs involving branching, iteration (repetition), and user input* (ACTDIP020)
- Years 7 and 8—*Plan and manage projects, including tasks, time and other resources required, considering safety and sustainability* (ACTDIP033)
- Years 7 and 8—*Design the user experience of a digital system, generating, evaluating and communicating alternative designs* (ACTDIP028)



Fig 2:  
Evolution  
Maze



Fig 3:  
Smog  
Game



- Years 9 and 10—*Design the user experience of a digital system, evaluating alternative designs against criteria including functionality, accessibility, usability, and aesthetics* (ACTDIP039)

## CHALLENGE YOUR STUDENTS IN 2015

The Challenge is on again in 2015 with registrations opening in April. For further information about the Australian STEM Video Game Challenge and to see videos of the 2014 winning games go to [www.stemgames.org.au](http://www.stemgames.org.au). Join the Australian STEM Video Game Challenge community on Twitter @STEMGamesAUS

## REFERENCES

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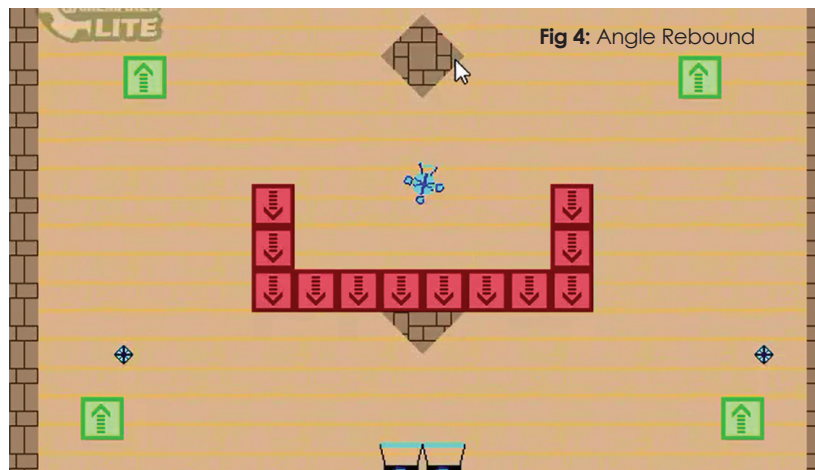


Fig 4: Angle Rebound

# Bush Blitz TeachLive 2015



**Want to work on a field survey with a team of scientists AND share this experience by 'teaching live' to your students back at school? Then Bush Blitz TeachLive is for you!**

Bush Blitz TeachLive 2015 will take five teachers (years 5–8) interested in science out on a species discovery survey, Bush Blitz\*. One place is reserved specifically for an early career teacher. You do not have to be experienced or science-trained just passionate about science and fieldwork and then sharing this passion with your students, colleagues and education networks. ([www.bushblitz.teachlive.org.au](http://www.bushblitz.teachlive.org.au))

**Where:** 'Olkola', Cape York Peninsula, QLD

**When:** Eight days, first half of term three (Date TBC)

**All travel, accommodation, board and full teacher replacement costs will be funded.**

**Online applications open Monday 2 March 2015 and close Monday 23 March 2015.**

To be eligible, teachers must be individual members of their state or territory Science Teachers Association. If you are not a member join now. Visit [www.asta.edu.au](http://www.asta.edu.au) for details.

For more information and to complete the application form visit

**ASTA.EDU.AU**

\*Bush Blitz is a biodiversity discovery program between the Australian Government, BHP Billiton and Earthwatch Australia that aims to document the plants and animals across Australia's National Reserve System. [www.bushblitz.org.au](http://www.bushblitz.org.au)

