

# Fizzees

A wrist-worn digital pet whose health and well-being is dependent on its owner's own physical actions, encouraging young people to be more physically active and to engage in a healthy lifestyle through the nurture of their pet.



“Child obesity has doubled in a decade. Junk food and lack of exercise have created a ‘public health time bomb’”

The Guardian, 22 April 2006

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# Overview

There are many games involving digital pets (such as Tamagotchis, Neopets etc), and there is widespread recognition of the need for children to adopt active, healthy lifestyles. The Fizees project aims to combine the two, encouraging 10 and 11 year-olds to become more active, and in so doing, nurture a digital pet which 'lives' on a wrist-worn screen.

The Fizee comes in two parts – a wristwatch-style device where the pet resides, and an unobtrusive heart monitor which straps around the chest. A sensor in the monitor measures the wearer's heart rate, and this data is sent to the Fizee device, which houses an accelerometer to monitor movement.

The Fizee then processes the combination of these two measures, and as the child exercises, the digital pet on the screen becomes visibly happier. His character develops over time, as he grows arms and legs, waves them about, and jumps up and down. The happier he becomes, the more he demonstrates his contentment.

The scoring system, which relates the child's activity with the growth of the Fizee, was

developed in tandem with the University of Bristol's Department of Exercise and Health Science, and the Chief Medical Officer's recommendations on the amount of exercise a child needs to be healthy. It also includes provision to ensure that over-training activity is not rewarded.

Each Fizee is calibrated for the individual child's age, size and fitness, so the results reflect the exercise needs of the wearer – the child who needs to exert more to climb a hill will be more rewarded for doing so than a fitter child. There is also a Fizees website planned, where the user can find out more about healthy eating, and compare results and activities with friends. Users will be able to investigate their own activity data in more detail and so take further charge of their own future health.

Unlike the 'wasted' nurturing effort that can happen with other digital pets, Fizees are unique in that they bring real benefit to the child, whilst encouraging both a healthy and caring outlook on life which they can carry with them into adulthood.



**“Imagine pushing a train uphill, so you can enjoy riding it down... it's a philosophy of engagement, desire and reward”**

Tash Lee, Futurelab

# Context



**“We believe that good health and effective learning go hand in hand, and habits started young are more likely to continue throughout adult life”**

Charles Clarke,  
‘Healthy Living Blueprint for Schools’ (2004)

It is vital to encourage a healthy lifestyle that is sustainable and integrated into daily routines. As such, the Fizzees project has been guided by the desire to encourage young people to play an active role in their own healthy development, in such a way that it builds naturally on their daily activities.

Fizzees can be closely related to current National Curriculum needs, which require children to learn how exercise affects the body, whilst the scoring mechanism reflects (and extends) the curriculum demand for a minimum of two hours’ worth of quality exercise a week, ideally gained on a daily basis.

However, Fizzee usage is not intended to be a school activity, but rather to be worn in daily life, encouraging moderate activity throughout the day in such a way that an awareness of healthy living and how best to achieve it simply becomes integrated into the child’s life and worldview.

As a game or toy, moreover, he or she is both engaging with a learning device and a ‘living’ creature, taking on board important lifestyle information and developing a caring outlook. Fizzees are also intended to encourage social activity and conversation, and to be fun, so the good habits learnt have more chance of becoming embedded within the child’s lifestyle.

# The audience

There is evidence to suggest that lifestyle habits are formed young. Therefore it is important to encourage children to 'take up the health habit' – especially before their level of physical activity often starts to decline, at the age of about 10 or 11.

Additionally, children using Fizees will have the chance to investigate:

- how the Fizee works, in terms of the relationship between their physical activity and their Fizee's growth and happiness
- what they need to do, and in what amount, to make their virtual pet's happiness increase

- how to interpret the resulting data (both the visual representation of the Fizee and the further information on the planned website)
- how to appreciate the long-term benefits to their health, which they gain through nurturing their Fizee.

With this in mind, in initial trials, the Fizee project was targeted at 10-11 year-olds. However, there is no reason why it should not be extended to older children and young adults – and even adults themselves!



**“The assertion that emerged was that active people were happier healthier and more productive”**

Hickey, 2003

# Aims, goals and learning objectives



**“Be healthy, stay safe, enjoy and achieve, make a positive contribution...”**

Every Child Matters programme

**“The Fizzzee makes you do more exercise and that's better for your health”**

Henry, aged 10

The over-riding goal is to encourage children to develop an applied understanding of what it means to adopt a healthy lifestyle, within a context of social responsibility. In order to achieve this, though, Futurelab needed to establish to what extent the Fizzzee can achieve this goal in terms of:

- the potential for this application of technology to promote reflection on healthy behaviour patterns
- the extent to which young people are motivated to nurture an avatar, such as the digital pet found in the Fizzzee
- whether this nurturing can actually encourage physical activity

- whether understanding the rule system behind the avatar improves their understanding of a healthy lifestyle
- whether the changes they see in the health of the avatar leads them to undertake more exercise
- whether nurturing the avatar transfers into nurturing their own bodies.

It is hoped that users will emerge with an understanding of what it means to lead a healthy lifestyle, coupled with the knowledge required to achieve this and the desire to do so.

# Research and findings

Four students from Headley Park Junior School in Bristol, aged 10 and 11, took part in two separate six-day research trials, in late 2006. The students and their parents were observed, interviewed and asked to keep a daily log relating to their emotional and physical response.

The findings were very encouraging:

- the students were happy to wear the wrist device and chest strap, and to care for their Fizzee; using it did not negatively interfere with their time at school or at home
- they all understood the concept of the character progression, and showed awareness of the link between their Fizzee pet and their own level of physical activity

- they especially enjoyed seeing their Fizzee grow, and increased the amount of exercise they took, as they wanted their pet to be happy
- they took great pleasure in communication features like their pet saying 'hello' in the morning, and they remained enthusiastic throughout the trial – they would all like to wear one again in future.

Being a prototype, there are of course practical elements that need improving before a further, large-scale randomised control test can be carried out.

It is therefore hoped that further funding can be obtained in order to address a few technical problems, with a view to manufacturing up to 200 enhanced Fizzees for broader trialling. A full test would include further research into the children's lifestyles before and after, as well as during, the trial period, to establish the depth and longevity of any changes observed.



**“I think it's really good how the character changes”**

Charlotte, aged 11

**“I played football and was running around a lot to get the heart rate up”**

Joe, aged 11

# How it works

## – the technology behind the screen



**“We want to use personal, accurate health data to provide immediate, appropriate and accurate feedback in a playful way”**

Dan Sutch, Futurelab

**“You need an increased heart rate AND physical movement to improve your score”**

Hans Daanen, Futurelab

The concept seems simple, but the technology behind the Fizzee project is complex.

- The **prototype** is made of a combination of a chest-worn heart rate sensor, and bespoke battery-operated wristwatch-style device. The screen on the Fizzee displays the pet, showing its happiness increasing as the child exercises, and beeping through a speaker. This happens as the processor inside the device computes the heart rate coming from the monitor, combined with the accelerometer data, and scores the pet's progress based on the child's physical activity. To do this, the heart monitor communicates directly with the processor. The device also includes a port for downloading the data onto a computer, and recharging the battery.
- The **scoring system** uses the interplay between the dual sensors – of the heart rate and accelerometer – to reflect the relation of physical activity to actual exertion. Both signals are important for it to function properly – indeed, the device will not increase

a score based on increased heart rate without movement, such as might be caused by stress. In this way it generates a model of healthy activity, but is also adapted to each child's personal circumstances – age, height, weight, fitness and stride. These elements all combine so the Fizzee grows in happiness and maturity based on the amount of effort required for each individual user.

The current prototype has been designed to work for a month, and if a child engages in the appropriate amount of physical activity, then they will progress to an optimum position by the end of the period. Each day the Fizzee picks up where it left off, allowing wearers to chart their progress both for that day, and overall to date.

However, once the Fizzee moves beyond a prototype, it should be possible to incorporate more powerful batteries and programming, to allow ongoing assessment and development so they become totally integrated with the user's life in the longer term.



# The future

The Fizees project has tremendous potential for commercial development. Once the prototype has been improved and wider research done, it will be possible to make the Fizee both smaller and more robust, for example including options for a range of avatar characters and more feedback potential.

Further work can also be done in terms of the associated website, to enable a fuller range of information, feedback and related games for users who log on at the end of the day.

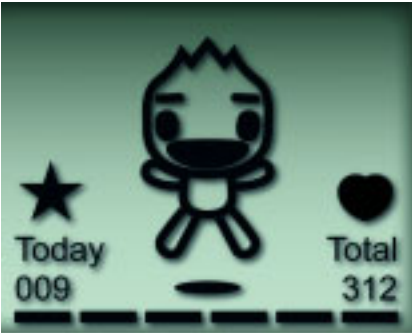
“Everyone who has seen it so far has loved it,” said Philip Dundas, who is responsible for the commercial development of the project at Futurelab. “It’s a great gadget and we would love to see it in toy shops within a year – several companies are interested in helping us to develop it. We’ve had positive encouragement from the Department of Health and we hope to be able to put it within reach of all parents, because we believe whole-heartedly in its educational potential and health benefits.”



**“It has tremendous commercial potential. Everyone who has seen it has loved it”**

Philip Dundas, Futurelab

## Meet the team



Projects such as Fizees are inevitably the result of cooperation between individuals and organisations. Stemming from a Futurelab Call for Ideas (where support is available to turn innovative ideas into a working prototype) – the idea came from Dan Sutch at Futurelab – we have also worked closely with DK Arvind and his research team at the University of Edinburgh, to develop both the hardware and software for the prototype, and with the Department of Exercise and Health Science at the University of Bristol to create the scoring system.

At Futurelab, the people who have made it possible are: Keri Facer (Research Director), Clara Lemon (R&D Project Manager), Graham Hopkins (Associate Project Manager), Dan Sutch and Tash Lee (Learning Researchers), Hans Daanen (Technology Research Manager), Jo Morrison (former Creative Director).

Our thanks also go to the children, their parents and teachers from Headley Park Junior School, who helped us with our trials and research.

If you are interested in helping to develop this project further, please contact us at [info@futurelab.org.uk](mailto:info@futurelab.org.uk)







Futurelab is passionate about transforming the way people learn. Tapping into the huge potential offered by digital and other technologies, we are developing innovative learning resources and practices that support new approaches to education for the 21st century.

Working in partnership with industry, policy and practice, Futurelab:

- incubates new ideas, taking them from the lab to the classroom
- offers hard evidence and practical advice to support the design and use of innovative learning tools
- communicates the latest thinking and practice in educational ICT
- provides the space for experimentation and the exchange of ideas between the creative, technology and education sectors.

A not-for-profit organisation, Futurelab is committed to sharing the lessons learnt from our research and development in order to inform positive change to educational policy and practice.

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