Your challenge

Groundbreaking science involves creative thinking as well as excellent scientific enquiry skills.

Now it’s your turn to think outside the box! Use what you’ve learned about dementia research to come up with your own research idea that will contribute towards the understanding of dementia.

Step 1 – Choose an area

Think of a specific area of dementia research that you would like to focus on or develop a question around. For example, some of the skills that people with dementia find difficult include: memory, navigation, concentration, problem solving, language, and ability to judge distances.

Step 2 – Develop your question

Think about something you really want to know within your chosen research area. Come up with a question that you will investigate.

Step 3 – Consider your method

Consider the methods you will use to investigate your question. These should be practical, ethical and safe! Think about the many different ways that scientists conduct research, such as experiments, surveys and observational studies – you could even develop a game or app (see the Sea Hero Quest case study)!
Step 4 – Pitch for research funding

There’s not enough funding for all scientific research – only the most promising ideas are taken forward. To secure funding for your research you’ll need to present your research proposal at a class science summit. You’ll get three minutes to ‘sell’ the benefits of your proposal. Your presentation should cover:

• How and why you developed your proposal.
• The methods you plan to use.
• What problems you might face and how you’ll get around them.
• How your proposal will further understanding of dementia.

You can use diagrams, images, slides, or demonstrations to convince your fellow scientists that your proposal should be chosen.

Success criteria

• Show that you understand your research area and why it’s important.
• Make sure your research question is clear and interesting.
• Show that you’ve considered your method carefully.
• Excite your fellow scientists about your proposed work.
• Demonstrate how your proposal will further understanding of dementia.

Alzheimer’s Research UK is using innovative approaches to research to help defeat dementia. Three examples of research projects that won funding are described in the case studies below.
Sea Hero Quest
– a gaming app providing data about normal navigation skills

The question

People with dementia often lose their sense of spatial navigation – that’s a person’s ability to find his or her way around an environment. This is why people with dementia can get lost easily or confused when they’re somewhere unfamiliar. Researchers wanted to investigate this problem, but didn’t know enough about navigation skills in people without dementia to make useful comparisons. The solution lay in something that most of us use every day!

The method

Alzheimer’s Research UK has teamed up with a telecommunications company to produce a smart phone game – Sea Hero Quest – which can be played by members of the public. More than 2 million people have downloaded the app so far!

The game monitors how players navigate its virtual landscape and use their sense of direction. Data is submitted anonymously and Alzheimer’s Research UK’s scientists are helping to build a picture of what healthy navigation skills are like across people of different ages.

The benefits

This knowledge will allow scientists to draw comparisons between normal navigation skills and those of people with dementia – this brings us a step closer to understanding, diagnosing and treating dementia.

You can find out more about Sea Hero Quest at: www.seaheroquest.com
An experiment testing the effectiveness of a hormone nasal spray

The question

People with a particular type of dementia – frontotemporal dementia (FTD) – can lose their ability to show social awareness and empathy, which can be very distressing for them and those around them. These abilities have been linked to the hormone oxytocin, which is found naturally in the brain. Researchers wanted to investigate whether giving oxytocin to patients (via a nasal spray) would increase social awareness and empathy.

About clinical trials

Clinical trials test how effective a new treatment is. They often use a fake treatment, called a ‘placebo’, alongside the real one – half the participants get the treatment, half get the placebo, but participants don’t know which they are getting. Patients sometimes say they feel better if they believe they’re receiving a treatment, so using the placebo helps to control the variables, make the test fair and ensure the true effect of the treatment can be properly measured.

The method

Researchers are working with 100 volunteers with FTD, splitting them into two groups. Every morning for four weeks, Group A are given oxytocin nasal spray and Group B receive a placebo (a nasal spray without oxytocin). After a four week ‘rest’ period to make sure all drugs have left the participants’ bodies, the groups are swapped – B gets the oxytocin and A gets the placebo. Throughout the trial, researchers use various methods to test participants’ levels of empathy and social awareness. Carers are also asked questions about their own wellbeing.

The benefits

If the researchers show that oxytocin can help people with FTD, this trial could help to manage symptoms in this type of dementia, leading to improvements in wellbeing and quality of life for people affected, their carers, and those around them, as well as helping to manage this type of dementia.
Observational, longitudinal study investigating the causes of Alzheimer’s disease

The question

Although the risk of developing diseases like Alzheimer’s increases as a person gets older, most people – even when they reach their 90s – don’t have dementia. This shows that there’s more involved than simply ageing. Researchers want to find out why some people develop Alzheimer’s and others don’t, and how a person’s genes and lifestyle influence their risk of the disease.

The method

Researchers are working with a special group of 500 volunteers who were all born in the same week in 1946. The volunteers have worked with doctors and scientists throughout their lives, giving the research team detailed information about their childhood development, health and lifestyle.

The volunteers take part in:

- Memory and thinking tests to measure how well the brain is functioning and whether there are any signs of Alzheimer’s disease.
- Brain scans to study the structure of the brain, how hard areas of the brain are working, and whether the brain shows any characteristic changes linked to Alzheimer’s.
- Blood and spinal fluid tests, which allow researchers to look for changes in these fluids that could indicate the early stages of Alzheimer’s.
- DNA samples to look for genes that are more common in people who go on to develop Alzheimer’s.

The benefits

By comparing the health of the brain and performance on memory and thinking tests with the volunteers’ genetic makeup, lifestyle and life experiences, researchers will learn more about the risk factors for Alzheimer’s. This knowledge could help to develop new treatments to keep the brain healthy and delay the onset of symptoms. The project will also provide important information about the earliest changes in Alzheimer’s, even before symptoms start to show. This could help advance the development of new diagnostic tools to help detect the disease earlier.