

Instructions to Grow your Newton's Apple Seeds: Celebrating International Science Centre Day 10 November 2016

Sir Isaac Newton was famously sitting under an apple tree, when a falling apple inspired his revolutionary theories about gravity. Today, you are receiving seeds from that very same apple tree to grow your own Newton's Apple Tree which we hope will inspire others in generations to come. We anticipate that you will want to grow the tree with the help of school children and the public, and share its story and journey with them online or in person and ultimately plant the tree in a few years time in a prominent public place.

This unique and rare opportunity is brought to you by The UK Association for Science and Discovery Centres (ASDC), as a celebration of the World's first UNESCO-backed International Science Centre and Science Museum Day on **10 November 2016**

The apple pips have been donated by National Trust's Woolsthorpe Manor in Lincolnshire, the birthplace and family home of Sir Isaac Newton. Newton's tree still flourishes in the orchard there and continues to inspire visitors from all across the world.

Message from Dr Penny Fidler:

The Instructions below have been kindly given to ASDC by the Royal Horticultural Society. I have then summarised the advice, and any errors are likely to be mine! There appear to be many different methods to grow apple trees from seeds, ranging from growing outside (covered to stop small creatures eating them) to various fridge options. I have tried to make the instructions clear and simple. However, if you have the benefit of local apple seed expertise, horticulturalists or a botanical garden, I would strongly suggest you show them this document, discuss options and then follow their advice entirely, as they will have their own green fingered methods. Don't mix and match methods. If you do use a different method, or choose to plant outside please keep a record so we can see which methods create the highest number of seeds to germinate. The method below we hope will double germination rates of these precious seeds as compared to simply sowing in the ground.



STEP 1: On arrival of Newton's seeds

- The envelope with the seeds is large and white and has with compliments from ASDC on the back of it. Please open carefully. Please make sure you check on Tuesday and Wednesday to see it has arrived so it is not left in Goods in. If you don't have it by Thursday call ASDC.
- Some centres will receive dried seeds, others will receive seeds that are being kept damp in damp tissue paper. Please note which you have.
- You have been sent several seeds as not all will germinate. We would expect 1 in 5 to germinate outside in the soil. The instructions below could increase the odds to 1 in 3
- If you can't sew immediately keep seeds damp and in the fridge - check they don't rot and sow as quickly as possible
- Don't warm your seeds - they will get heat-stress
- Don't leave near a radiator for example!



STEP 2: November 10

- Prepare a flower pot (around 6" diameter). You will be planting all the seeds in the same pot, separately sowed. The soil should be a peat-free multipurpose potting mix, that you can buy from a garden shop or Amazon.
- It is best to mix this with 50% sharp grit. This means the soil drains well. Don't add any fertilisers or miracle grow. A bag of grit can be bought from a garden centre or online.
- Make some little holes and put one seed in each. Cover with a very thin layer of fine grit or compost - approx 1-2mm deep / just enough to obscure the seed
- With the soil moist (not soggy), wrap in a clear plastic bag and pop into a regular domestic Fridge for 12 weeks. This will take you til early February and simulates winter. The seed detects temperature, and the cold is needed to initiate germination. The plastic bag means you don't have soil falling in your food, with the benefit of meaning you don't need to water it for the 12 weeks. Use the fridge normally opening and closing the door as normal - these temperature fluctuations are good.



STEP 3: On February 1 2017

- Take the pot out of the fridge. Take it out of the plastic bag. Put it on a window sill.
- Choose your window ledge carefully. It must NOT be a really hot window ledge where it will bake in the sun and overheat. It must NOT be one with a radiator - the heat stress will damage it. Maybe there is a cooler window ledge in a corridor or storage area.
- Water a little every 2-3 weeks. Watering every week is far too much and the seed will rot. The grit in the soil means it will drain well.
- Don't ever over-water these seeds. They will rot.
- The soil should be moist but never wet or soggy
- The date is approximate

STEP 4: When sprouted

Potting on should be done a year after sprouting in the spring. ie in April 2018 at the earliest. Get local expertise to help if you have not done this before.

When will you see little sprouts of the apple tree?

If you are lucky you will see these in the Spring or Summer 2017, perhaps in Autumn
Perhaps you might have to wait until the following Spring 2018. If nothing by then you can put the pot outside in someone's garden and see if nature does its thing.

What kind of apple will we get?

This is a very interesting question. Seeds don't produce the same apples as the parent tree. This is because seedling apples are an example of 'extreme heterozygotes', in that rather than inheriting DNA from their parents to create a new apple with those characteristics, they are instead significantly different from their parents. The only way to reliably get the same apples is to take a piece of apple tree and graft it onto a root stock. This means you will all get something different and it will be very interesting to find out which ones bear fruit in the years to come. A national Experiment befitting of Newton's descendant trees.

Can I just grow it outside?

Yes, in a pot outside. In fact fluctuating temperatures are good at breaking dormancy. However to increase success rates, never let the pot get full of water when it rains as the seeds will rot. We would propose putting the pot in a cold frame (glass box) or under a glass sheet so it doesn't get any rain on it, and then ensure it doesn't dry out. Also put wire mesh over it so it doesn't get eaten by hungry little creatures. We suggest you seek local expertise if taking this approach.

Interesting fact and circularity

Newton wrote Principia, which is at the Royal Society where we announced this programme. Tim Peake took some of the seeds from Newton's tree into space, his mission was called Principia and an apple features on his mission patch. Apples were first found in Kazakhstan where Tim Peake launched into space on his Principia mission. <https://en.wikipedia.org/wiki/Apple#History>

