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| **Activity title** |
| **Make salt dough Christmas decorations** |
| **Stay safe** |
| Whether you are a scientist researching a new medicine or an engineer solving climate change, safety always comes first. An adult must always be around and supervising when doing this activity. You are responsible for:    • ensuring that any equipment used for this activity is in good working condition  • behaving sensibly and following any safety instructions so as not to hurt or injure yourself or others    Please note that in the absence of any negligence or other breach of duty by us, this activity is carried out at your own risk. It is important to take extra care at the stages marked with this symbol:⚠ |
| **Time required** |
| 1 hour plus |
| **Activity summary** |
| Part of the fun at Christmas time is to decorate the tree. In this challenge you can make your own decorations in salt dough, in any shape you like! You can even paint them and unlike normal cookies they will last a very long time. |
| **What equipment will you need?** |
| * 200g plain flour * 50g of salt * 75ml of warm water * Baking paper * Cookie cutters * A skewer and a fork * A straw * Lengths of ribbon, string or twine * Coloured acrylic/poster paint and brushes * PVC white glue   And have an adult to help. |
| **How to do it** |
| Watch the video here: ADD LINK TO VIDEO  **Step 1** ⚠  Preheat your oven to 300f / 150c / gas mark 2.  **Step 2**  Use measuring scales, measure the flour into the bowl. Add the salt and water and stir together. It should begin to get sticky.  **Step 3**  Use your hands to squish the ingredients together until it’s a smooth dough. If it is too wet, add a little more flour, if it cracks add a little more water.  **Step 4** ⚠  Roll your dough out onto the baking paper until it is approximately 1cm thick and use your cookie cutters or a skewer to make your outline shapes. Remove the excess dough – you can use it to make more decorations!  **Step 5** ⚠  Use a straw to push a hole through at the top of your shape. That is for the ribbon to hang your decoration on the tree but not until they have been baked. You can create texture on your decoration with the skewer or a fork.  **Step 6** ⚠  Bake in the oven for around 1 hour or until firm to the touch – don’t worry if they go a little brown.  **Step 7**  When they have cooled, you can paint your decorations in any colours you like. You could even use some glitter to make them extra special!  **Step 8**  When the paint has dried, a thin coat of PVC white glue can help give your decoration a shine.  **Step 9**  Give the glue a chance to dry too then add your ribbon or string!  **Well done – you’ve cracked the Christmas challenge!** |
| **Here’s the science** |
| In this challenge we made decorations from dough that will last for a very long time – they won’t go mouldy like normal dough – but why is that? Let’s take a bite of the science! |
| **Sensational salt** |
| The salt we use for cooking is a compound of equal numbers of sodium and chloride ions, packed together in a crystal lattice form. If you have a magnifying glass take a look at a few grains – especially sea salt. You will be able to see the crystals for yourself. |
| **Preserving power!** |
| So how does it help to preserve our food? It all starts with a process called **osmosis**.  If you have two substances, and one or both contain water, the water will always try to mix itself equally throughout the solution.  Think about making a drink of squash. The squash from the bottle contains less water than the water you add from the tap but when you’ve mixed them together, the squash we drink has an equal amount of water throughout. This happens at the levels of cells – and if the cell wall is a membrane (meaning water particles can travel through), they always will equalise themselves throughout the two sides.  The cells in the molecules of the food we eat contain water – but salt does not and so the salt is absorbed into the food, and the moisture is drawn out – where it will evaporate.  The bacteria and moulds that make food stuffs go off need moisture to grow and so the less water around, the fewer of those nasties we will have, helping the food stay fresh for longer. Also, microorganisms contain water and so the salt will draw out their cell’s moisture and kill them too. |
| **Salty snippets** |
| Emeralds are green because of a small amount of a salt.  Because salt helps prevent food from decaying it has been used as a preservative for many centuries. This made salt so valuable that in some countries it was used as a way of paying for things.  You find salt in a huge number of processed foods - have a look in your kitchen cupboards and the fridge and see how many ingredients list salt - you might be surprised! (Hint - look at baked beans!) Did you know that your blood is saltier than the ocean! |