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| **Activity title** |
| **Rudolph thumbprint cookies** |
| **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 |
| **Activity summary** |
| Christmas is a time when we enjoy treating ourselves with lots of delicious dinners and tasty things to eat, and these Rudolph cookies, with his famous red nose are just the thing to get the festive party started! |
| **What equipment will you need?** |
| * 125g/4.5oz butter, softened * 70g/2.5oz caster sugar * 1 egg yolk * 1 teaspoon vanilla extract * 500g/5oz plain flour * A jar of raspberry or strawberry jam * A packet of pretzel snacks and chocolate chips for decoration * You will also need a mixing bowl and a wooden spoon or electric mixer * Non-stick baking tray * Teaspoon   And have an adult to help. |
| **How to do it** |
| Watch the video here: ADD LINK TO VIDEO  **Step 1**  Mix the butter and sugar in a large bowl with a wooden spoon or electric mixer until smooth.  **Step 2**  Add the egg yolk and vanilla extract and mix until well combined.  **Step 3**  Sift over the flour and stir until all the flour has been mixed in and no dry bits are left – use your (clean) hands to knead the mixture into a dough.  **Step 4** ⚠  Let the dough chill in the fridge for 20 minutes. Whilst the dough is chilling pre-heat the oven to 180C/160C fan/gas 4.  **Step 5**  Roll out dough balls – about the size of a 10p coin and place on the non-stick baking tray. Make sure you leave a gap between them as they will spread out a bit while they cook.  **Step 6**  Now to make Rudolph’s nose! Push your thumb firmly into each dough ball to make a hollow in the centre. Be careful not to push your thumb all the way through to the tray or the jam will leak out the bottom!  **Step 7**  Using a teaspoon fill the thumbprint hollow with a small blob of jam in each cookie.  **Step 8** ⚠  Bake on the non-stick baking tray for 10-12 minutes until pale golden. When cooked, carefully transfer the cookies to a wire rack to cool and crisp up.  **Step 9**  While still soft press chunks of pretzels into the top of the cookies for Rudolph’s antlers. Then, once the cookies are cool, use chocolate chips for his eyes.  **Well done – you’ve cracked the Christmas challenge!** |
| **Measurement madness!** |
| We have given the weight measurements for our ingredients in both ounces and grammes – but do you know what the difference between these two ways of measuring are? And why do we have more than one way to measure weights anyway? |
| **Here’s the science** |
| Ounces are part of what we call the i**mperial measurement system.** It includes ounces, pounds and tonnes when measuring weight, and inches feet and yards and miles when measuring length.  Grammes are part of the **metric measurement system**. It includes grammes, kilogrammes and metric tonnes for weight and centimetres, metres and kilometres for length.  The imperial measurement system is the oldest system and dates as far back as the Romans. The exact units of measurement might be different depending on where in the world you were, and even today there are differences – for example the American ounce is fractionally bigger than the English measurement!  Over the centuries many countries decided that they needed a common system that was shared and the metric system began to be adopted in the 1800s and is the official system for our country, even though we still see imperial measurements in some places – such as cookery books and on road signs (miles). |
| **Back to basics** |
| Did you know that only around three countries still use imperial measurements as their official standard? The vast majority of countries use metric measurements and the sensational seven official base measurement units are below:   |  |  |  | | --- | --- | --- | | **Symbol** | **Name** | **Quantity** | | s | [second](https://en.wikipedia.org/wiki/Second) | [time](https://en.wikipedia.org/wiki/Time) | | m | [metre](https://en.wikipedia.org/wiki/Metre) | [length](https://en.wikipedia.org/wiki/Length) | | kg | [kilogram](https://en.wikipedia.org/wiki/Kilogram) | [mass](https://en.wikipedia.org/wiki/Mass) | | A | [ampere](https://en.wikipedia.org/wiki/Ampere) | [electric current](https://en.wikipedia.org/wiki/Electric_current) | | K | [kelvin](https://en.wikipedia.org/wiki/Kelvin) | [thermodynamic temperature](https://en.wikipedia.org/wiki/Thermodynamic_temperature) | | mol | [mole](https://en.wikipedia.org/wiki/Mole_(unit)) | [amount of substance](https://en.wikipedia.org/wiki/Amount_of_substance) | | cd | [candela](https://en.wikipedia.org/wiki/Candela) | [luminous intensity](https://en.wikipedia.org/wiki/Luminous_intensity) | |
| **How do we know our weights are correct?** |
| So how do we know that, say, all the gramme weights are exactly the same weight? Well, it's all thanks to an organisation called the International Bureau of Weights and Measures or BIPM for short. They’re an organisation whose job it is to ensure that whatever the unit of measurement we are using, whether weights for grammes, rulers for centimetres or a clock for minutes, they will be checked against a master measurement for accuracy. |
| The BIPM was created on 20 May 1875, in France following the signing of the Metre Convention, the organisation now includes 59 countries. |
| This task takes many forms, from directly comparing weights and measures with each other and sometimes using atomic clocks which use the movement of atoms to describe measurements of time such as a second. |