

## WHAT'S IN A MINCE PIE?

Children explore a range of 'mixtures' presented in a shopping bag and focus their attention on a box of mince pies. They should attempt to separate and identify the ingredients in a mince pie, developing their understanding of mixtures and types of change. Pictorial, photographic or written records of findings are all simple ways for children to explain that there are often mixtures within mixtures.

### TYPE OF ENQUIRY

Identifying, classifying and grouping/Researching using secondary sources

### OBJECTIVES

- To explore and be able to describe a mixture made from solid and liquid ingredients
- To gather, record, classify and present data in a variety of ways to help answer questions

### To be able to:

- Understand that some mixtures are permanently changed into new things and others can be separated back to the original ingredients
- Appreciate that there can often be mixtures within mixtures

### SCIENCE VOCABULARY

Mixture	Solid	Liquid
Ingredient	Separate	Group
Sort	Classify	Identify
Change	Reversible	Irreversible
Permanent		

### RESOURCES

Per class:

Jar of sweet mincemeat (available from supermarkets throughout the year), shopping bag containing commercial products such as instant soup, pre-made sandwich and a box of chocolate crispy cakes or muffins

Per group of 4 children:

- Mince pie
- Round edged knife
- Teaspoon
- 2-4 cocktail sticks,
- Hand lens (if available)
- List of mincemeat ingredients from the packaging
- Kitchen Chaos cartoon strip (optional)

## PRIOR KNOWLEDGE/EXPERIENCE

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Children will have compared and grouped materials, focusing on similarities and differences.

## ACTIVITY NOTES

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At any time during the nine activities in this resource, the Kitchen Chaos cartoon strip can be shared on-screen with the class.

Refer to Safety guidance and check for individuals with allergies before presenting a shopping bag containing commercial products that the children might recognise as mixtures. Take out a box of mince pies and give a pie to each group in the class. Ask children, "Is your pie just one thing or a mixture of things?" Children should cut their mince pie in half to reveal the pastry and the mincemeat filling, thus showing that a pie is made up of a mixture of at least two separate things.

Ask, "Can the mixture of pastry and mincemeat be separated?" Discuss children's ideas and suggestions before inviting them to separate the two – this can be done easily by scooping the mincemeat out with a spoon onto a paper towel.

Focus discussion on the baked pastry case of the pie and ask "Is this just one thing or a mixture of things?" Extend children's thinking by commenting how it looks like just one thing and then challenging them to separate the ingredients using equipment provided. Discuss how the mixture cannot be separated easily as the ingredients, which made this mixture, have been changed permanently with heat during baking (this concept can be covered in more detail during the Baking activity).

(Note: the mixed ingredients would be difficult to separate prior to baking, but changes due to heating can be noted, eg colour and texture.)

Repeating the questions again for the mincemeat may lead to disagreement over whether this mixture can be separated. Children are asked to separate a spoon of mincemeat (straight from the jar) placed on a paper towel, using cocktail sticks. Once complete, they can use a hand lens and a list of mincemeat's ingredients as a secondary source of information to identify what they have found.

Give children a list of mincemeat ingredients, and ask them to discuss which they have identified and which they cannot see, or separate, and why. For example, children may notice that this mincemeat looks different to that in the mince pie they explored, as they can no longer see the suet, which has melted during baking. Discussion can now scrutinise the nature of the separated ingredients in a mince pie, i.e. are any of them mixtures? Children could create and present a pictorial, photographic or written record of their findings in answer to "what's in a mince pie?" before disposing of any remaining ingredients.

For a summary of questions asked throughout this activity, please refer to Questions for thinking.

## EXTENSION OR HOME-BASED ACTIVITIES

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Children could explore the remaining contents of the introductory shopping bag or from their kitchen cupboard at home and think about whether or not products such as instant soup, a pre-made sandwich, chocolate crispy cakes or muffins are made up of mixtures of ingredients, and whether any of these mixtures are made from mixtures of things too. They could also think about whether the ingredients can be separated or if and how they might have undergone some kind of permanent change.

## QUESTIONS FOR THINKING

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- What mixtures have you used, or been in contact with, today?
- What mixtures can you find in your kitchen?
- Is your breakfast cereal just one thing or a mixture of different things?  
How do you know this?
- Is it easy or difficult to separate and sort the different ingredients in your breakfast cereal? Why?
- Can you put all the ingredients back together again?
- What type of scientist do you think would experiment with and explore mixtures?

## SAFETY GUIDANCE

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- Please use the following health and safety information to produce your own risk assessment for this activity:
- Prior to this activity, check for individuals who may be allergic to any of the ingredients used in mince pies or mincemeat, in particular those with nut allergies.
- At the end of the separation activity, the used mincemeat should not be eaten, but rolled in the paper towels and thrown away.

## INDUSTRY LINKS AND AMBASSADORS

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Separating ingredients is a core industrial process. Many manufacturing companies use sieves and sieving machines, which apply a simple technique to separate particles of different sizes. Watch a **1-minute video** showing industrial sieves separating cookie sprinkles.

Links with the food industry will be most accessible to children; however, it should not be too difficult for them to appreciate that many non-food industries also need to separate ingredients to make their products. A wide range of companies use sieving techniques to ensure that any oversized contamination (which may have accidentally found its way into the mixture) is removed and the quality of the final product is improved.

Another example of separation can be found at [industry-animated.org](http://industry-animated.org), which demonstrates a filter press separating solid powders from liquids (in this case, the powder is the product – a pigment to add to dyes). More information about sieves and filters can be found at [www.colour-ed.org](http://www.colour-ed.org).

If working with an Ambassador, ask them to bring relevant images, video clips or artefacts such as sieves and filters to show to children and explain how these are used on a large scale.

## CROSS CURRICULAR LINKS

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**English:** opportunities to use spoken language to develop understanding through speculating, hypothesising, imagining and exploring ideas. Also links to writing whereby pupils identify audience and purpose, as well as selecting the appropriate form.

**Mathematics:** links to sorting, classifying and grouping, mass and volume.

**Design and Technology:** thinking about how mince pies have been made and how ingredients change in the baking process provides links to preparing and cooking a variety of dishes using a range of cooking techniques.