Teacher Notes

Science Inquiry Focus:
What happens to the property of materials when they are used to create a mixture?

Skills Development/Working Scientifically:
- Questioning and predicting
- Observing
- Investigating and measuring
- Estimating and measuring
- Recording and communicating

Science Learning Outcomes:
- Pupils observe mixtures of materials, ask questions about and describe properties of the combinations.
- Pupils understand that science is used in daily life, including when combining materials; for example, when stirring sugar into a cup of tea or adding salt to a recipe.

Technology/Engineering/Mathematics Links:
- Allocating a combination of materials to a category.
- Observing similarities and differences in properties of materials.

Assessment Focus:
- Use pages 95 and 96 as a formative assessment to gauge the pupil's understanding of what a mixture is and whether it changes the ingredients into a new substance with new properties.
- Pupils can be asked to choose one combination of materials, such as vinegar and oil, and write and/or draw about the result of the experiment and the change in properties of the materials. This may be used as a formative assessment activity.

Background Information

- Mixing materials together creates a mixture. The substances are physically combined and can be separated again by methods such as sieving, filtering or evaporating. The change can be reversed and a new material is not formed; for example, when salt is dissolved in water it can be retrieved by evaporation.
- Mixing some materials together can create a new substance. In this case, a chemical change has taken place which usually cannot be reversed. The original materials cannot be easily retrieved. Properties can be altered when materials are mixed; for example, vinegar when combined with bicarbonate of soda causes a chemical reaction and carbon dioxide bubbling to occur. The substance is changed and not reversible.

Resources

- Materials for mixing experiments—flour and water, oil and vinegar, lemon juice and icing sugar, detergent and oil, flour and eggs, sugar and water, vinegar and bicarbonate of soda
- Scanned or enlarged copy of page 94
- Sufficient copies of pages 95–96

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Lesson Plan

Introduction:

1. *What did you have for breakfast today?* After a brief discussion, display the breakfast items on page 94 to the class. *What do the items in Column A have in common? What do the items in Column B have in common?* Pupils should be able to conclude that the items in Column A are not mixtures, but the items in Column B are. *How is mixing different to combining materials from the previous lessons?*

Development:

2. In pairs, pupils go through each item in Column B and list the materials that make up the mixture, using page 95. Pupils can also suggest two other mixtures they are aware of or commonly have for breakfast.
3. In small groups, pupils rotate around stations set up with ingredients to mix. Using a copy of page 96, pupils observe the individual properties of the ingredients prior to mixing and then observe and record the properties once mixed. Pupils suggest possible uses for each mixture.

Possible answers include:

flour and water—white, gluggy, thick—glue, papier-mâché

oil and vinegar—doesn't mix—salad

lemon juice and icing sugar—thick, white—icing a cake

detergent and oil—mixes/joins together—washing dirty dishes

flour and eggs—thick liquid—baking

sugar and water—sugar disappears (dissolves), clear, watery—drinks

vinegar and bicarbonate of soda—bubbles up—cleaning, cooking

Differentiation

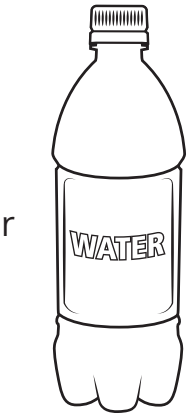
- Guided group work, assisted by an adult will ensure that all pupils have the opportunity to mix the ingredients and to successfully record the outcomes. (Outcomes can be written, drawn or through an audio recording.)
- Some pupils can be given a word list to support them in recording the properties of the ingredients.
- Some pupils can be challenged to write more detailed observations, or even create their own mixtures to observe what happens to the properties.

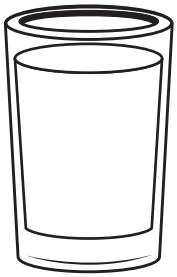
Reflection:

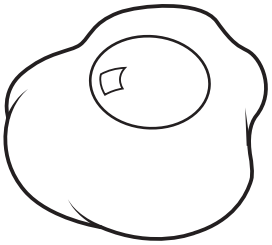
4. As a class, discuss and compare the results of mixing the ingredients and what the resulting properties were. *Did all of the mixtures change the properties of the ingredients? How would you use the mixtures?*
5. In a round-robin circle, pupils respond with one mixture they have used in their daily life.

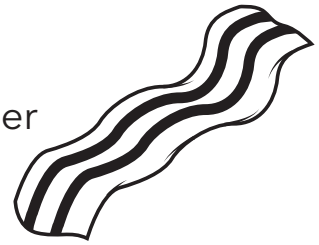
Breakfast Foods

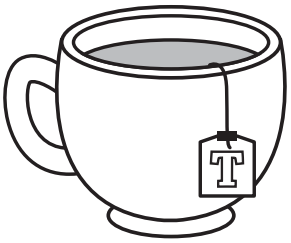
Column A	Column B
water	cup of tea
glass of milk	bowl of cereal
fresh orange juice	muesli
eggs	fruit salad
rasher	toast with jam

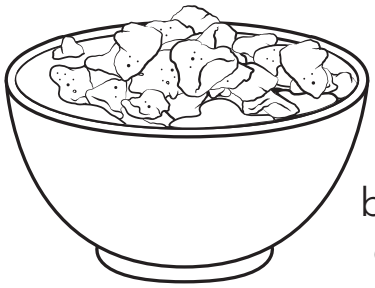


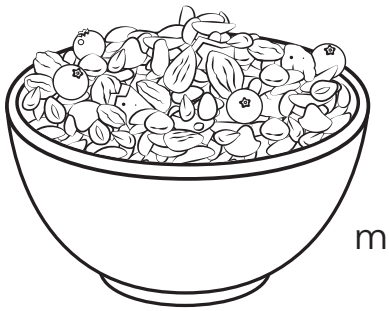


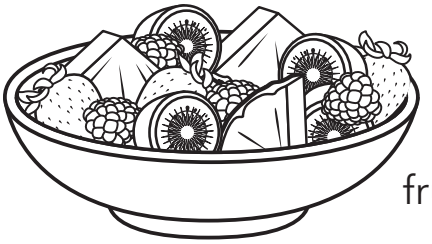


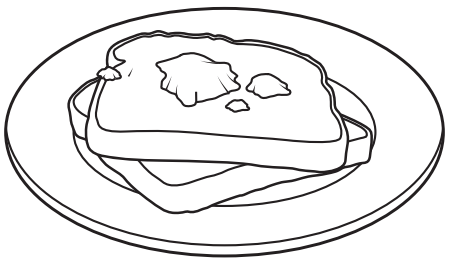












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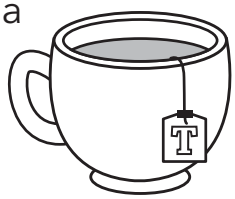
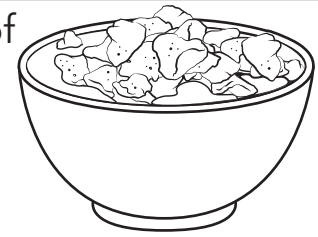
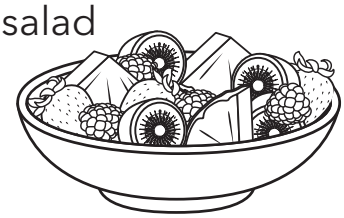
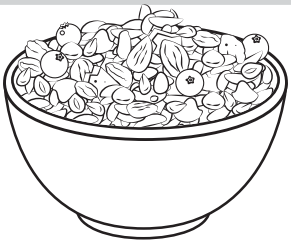
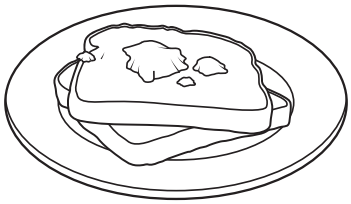
Breakfast Mixtures

Breakfast food	Parts of the mixture
cup of tea 	What is tea made up of?
bowl of cereal 	What is cereal made up of?
fruit salad 	What is fruit salad made up of?
muesli 	What is muesli made up of?
toast with jam 	What is toast or bread made up of?
List two other mixtures.	

Mixing Stations

Mixture	What happens when mixed? Describe the properties.	How could this mixture be used?
flour and water		
oil and vinegar		
lemon juice and water		
detergent and oil		
flour and eggs		
sugar and water		
vinegar and bicarbonate of soda		

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