DIY Mixture Separation Experiment

Years 6 & 7

Overview:

All substances have different properties that make them unique. When substances are combined into a mixture, the properties of each substance may allow them to be separated back out of the mixture again. If so, this is an example of a reversible change. Methods of separating out substances from a mixture can include dissolving, filtering, evaporating, sieving, decanting and hand-picking. Your challenge is to design and test a procedure using a given set of equipment to separate out individual substances from a given mixture.

Core alignment to Australian Curriculum:

Year 6

Chemical sciences

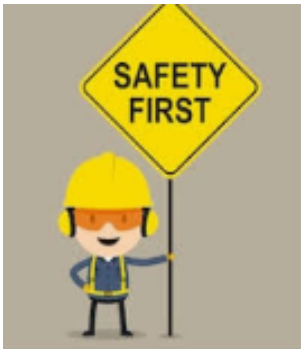
- Changes to materials can be reversible or irreversible

Year 7

Chemical sciences

- Mixtures, including solutions, contain a combination of pure substances that can be separated using a range of techniques

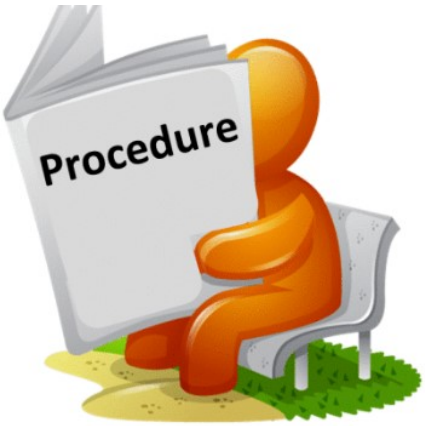
Safety:



- **Not to be eaten!**
- Parents/guardians, please check whether any materials are known to cause **allergies or sensitivities** in your child (via skin contact) before proceeding. Gloves can be worn for duration of experiment if you're happy for your child to proceed.
- Thoroughly wash hands before and after activity.

Materials:

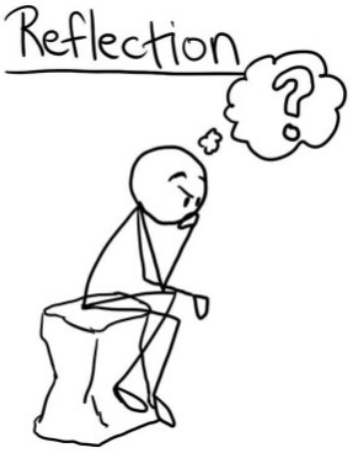
- Substance 1: salt (1 tablespoon)
- Substance 2: flour (1 tablespoon)
- Substance 3: uncooked rice (1 tablespoon)
- Substance 4: ½ an apple (chopped into small pieces)
- Spoon
- Small mixing bowl
- Water (whatever volume you need)
- 2 to 3 bowls
- Tea towel (folded in half)
- Fine-meshed food strainer



Procedure & Questions:

1. Before you create your mixture, test the properties of each of the four substances listed in the Materials. Testing one substance at a time, use a ***very small portion*** to check:
2. Can it be hand-picked?
3. Is it large enough to be trapped by a sieve?
4. Does it float?
5. Is it soluble in water (make sure you look very closely to check this)?
6. Any other checks you want to do
7. Discard all your tested quantities and dry any containers/spoons used for testing.
8. Based on what you learned through your tests in step 1, design and write out a step-by-step procedure for how you would separate out a mixture of salt, flour, apple pieces and uncooked rice. HINTS:
9. You can use a piece of equipment more than once
10. All pieces of equipment listed in the Materials are necessary
11. Consider which methods of separation will need to be done earlier than others.
12. Discuss your ideas with a parent or guardian and make any modifications you need to your procedure. Now you're ready to test!
13. Add 1 tablespoon (tbsp) of salt, 1 tbsp flour, 1 tbsp uncooked rice and ½ an apple (chopped into small pieces) into the mixing bowl and stir with a spoon until well combined. This is your **mixture**.
14. Begin to test the procedure you created, separating each substance out from the mixture

Reflection:



Record your answers to the following questions beneath the procedure you wrote.

- Were you able to separate all substances from each other? If not, which substances were still mixed?
- After testing your procedure, would you make any modifications (e.g. change the order of the separation techniques or use different techniques)?
- When each substance was separated out from the mixture, how did it look compared to before it was added to the mixture in the first place? If any substance looked different at the end, explain why.
- If you successfully separated out all substances, what were you left with as your end result? If you could use a fore more pieces of equipment and add another couple of steps to your procedure, would you be able to completely return each substance to its original form? Discuss with your parents and, with **parental/guardian permission and supervision**, see if you can achieve this.

Once you've finished your experiment, wash up, dry and pack away all equipment and clean your work area. When finished, wash your hands thoroughly.