Year 8 Science: Home Learning Week 4

Hello Year 8, we'll be following the BBC Bitesize lessons from now on. There are three science lessons per week, one each for biology, chemistry and physics. I'll tailor the activities listed here according to the topics covered in these lessons. Please watch all three lessons and then complete some of the activities listed below – you can choose which and how many to do.

I'll try to include a practical activity each week but remember to get permission from an adult before doing anything and clean up after yourself when you're finished! There are also some more "live lessons" this week from the Field Studies Council, they're totally optional but look like they'll be interesting if you want to have a go!

Stay at home & stay safe

Miss Johnston ☺

Task	Description
1	Watch the BBC Bitesize lessons on Tuesday (biology), Wednesday (chemistry) and Friday (physics). Here's a link to the daily lessons page: https://www.bbc.co.uk/bitesize/tags/zvdbbdm/year-8-lessons/1 If you have trouble watching online, you can access the Bitesize lessons via the red button on your TV remote. Just switch the TV to BBC1, press the red button and the Bitesize options should come up… It can take a minute or two to load so be patient!
2 a	**Biology** a) Visit BBC Bitesize, revise your knowledge and complete the quizzes on organ systems: https://www.bbc.co.uk/bitesize/topics/znyycdm/articles/zbpdqhv b) Can you write your own explanation of what an organ system is? Try to include an example and the key words: cells, tissue, organ, organ system c) Create a script, act out or (if possible) film an information video about organ systems, aimed at children in year 4. Be creative – could you involve your pets?
3	**Chemistry** a) Visit BBC Bitesize, revise your knowledge and complete the quizzes on the rocks: https://www.bbc.co.uk/bitesize/guides/zgb9kqt/revision/1 and the rock cycle: https://www.bbc.co.uk/bitesize/guides/zwd2mp3/revision/1 b) What are the three main types of rock and how are they formed? c) The Cheviot is the remains of an extinct volcano that was active during the Devonian period, around 350 million years ago. What type of rock would you expect Cheviot and the surrounding hills to be formed from? d) How do grains of sand from sandstone end up on a beach? Use diagrams to explain.
4	**Physics** a) Visit BBC Bitesize, revise your knowledge and complete the quizzes on forces: https://www.bbc.co.uk/bitesize/topics/z4brd2p/articles/zkcpfcw b) What is the difference between mass and weight? c) What is gravity? How does it affect how much we weigh? d) Create a visual example (by drawing a diagram or acting out examples) to explain gravity to someone in year 5.

5	**OPTIONAL PRACTICAL ACTIVITY: Using chemical reactions to make ice-cream without a freezer** If you wish, you can carry out the practical activity on the next page. Please ask permission from an adult before you do this, do not waste food and do not be tempted to pop out to the shop to buy ingredients! After you have done the practical activity, answer the following questions: a) When you added the salt to the ice cubes, a change occurred. What happened? b) Was the change in the salt & ice bag a chemical change or a physical change? Why do you think this? c) Was the change in the ice-cream bag a chemical change or a physical change? d) Adding salt (sodium chloride) to water lowers the freezing point of the solution. Can you use this information to explain why adding salt to ice causes it to freeze?

Practical details

Safety

You must wash your hands with soap and water before the activity

You must wear winter gloves during the shaking stage because the ice and salt mixture gets very cold; as low as -7 °C

Equipment & materials

- 1 tablespoon of full fat milk
- 1 tablespoon of double or whipping cream
- 2 level teaspoons of sugar
- ¼ teaspoon of vanilla extract
- 2 x tablespoons
- Kitchen towel
- Winter gloves (1 pair each)
- 6-8 large ice cubes
- 3 heaped tablespoons of salt
- Small zip/resealable food bag
- Large food bag
- 1 x teaspoon for measuring
- 2 teaspoons for eating
- Equipment per table
- 4 small bowls (for ingredients and salt)
- Tray or large bowl

Notes:
Try to use good quality food bags otherwise they split during the shaking stage

Make sure that the tablespoon used to measure the salt does not get used to measure other edible ingredients

Having a bowl/tray on the table for the used salt ice/water bags is useful

Method

1. Put 1 tablespoon of full fat milk into a small zip/re-sealable food bag

2. Put 1 tablespoon of double or whipping cream into the same food bag

3. Add 1 level teaspoon of granulated sugar and ¼ teaspoon of vanilla extract

4. Securely seal the bag and give it a little shake to mix the ingredients

5. Place the ice cubes and salt Into the larger food bag and shake it

6. Place the smaller, sealed ingredients bag inside the larger bag containing the ice/salt mixture, seal/knot the larger bag

7. Put on winter gloves and shake the bags until ice cream has formed (approximately 10 minutes)

8. Remove the small bag containing the ice cream, discard the large bag, wipe off any excess salt water, open and serve

Be aware when doing this practical

Don't be tempted to take the smaller ingredients bag out of the salt/ice bag too soon or the ice cream will not have frozen properly. If, after ten minutes, the ingredients don't appear to have frozen, add more salt and ice to the ice bag and re-shake.

Expected observations and results

Gradually the liquid ingredients will freeze and change in to solid ice cream.

Conversely the ice in the large bag will slowly melt.

Possible further activities:

- Observe what happens if you don't shake the ingredients
- Compare the temperature of the ice before adding the salt and then after 5 mins
- Observe how the ice cream mixture changes during the freezing time. Record the changes at different intervals e.g. 2, 4, 6, 8 mins
- Make ice cream without adding salt to the ice and compare the results
- Using alternatives to milk and cream e.g. yoghurt, lactose free dairy products, dairy free alternatives
- Use large salt crystals (used in salt grinders) instead of table salt. Compare the time taken for the ice cream to freeze and the texture of the ice cream

Background notes

Water freezes at $0^{o}C$. Adding salt to ice lowers the temperature at which water freezes and forces the ice to melt. The energy needed to melt the ice is taken from the surroundings and hence the temperature goes down. This means that the children will observe the ice melting even though the temperature is going down. This drop in temperature (to around $-7^{o}C$) is cold enough to freeze the ice cream.

This science is used in everyday life when we salt roads on very cold days to help stop ice from forming and to melt any ice/snow already there.

Shaking the ingredients improves the texture making a smoother ice cream by adding air bubbles and by evenly distributing the tiny ice crystals.