Worksheet 1.5 **What are some features of the Sun?**

Q1. Investigate the effect of magnets on compasses. Follow the method below, **record your observations** and use these observations to **draw a conclusion**.

Equipment: Blank page; Compass; Bar magnet; Pencil

Method:

1. Place the bar magnet in the middle of the page.
2. Place the compass at one end of the magnet (North or South pole)
3. Note the direction of the compass needle and mark a dot with a pencil on the page where the needle is pointing.
4. Move the compass to the other side of the dot you have just made and note the direction of the compass needle.
5. Mark a new dot with a pencil on the page where the needle is pointing now that the compass has been moved.
6. Repeat this process until you reach the other pole of the magnet.
7. Start again on the other side of the bar magnet.
8. Move the compass further away from the magnet and repeat the method again.
9. Record your observations.
10. Sketch a diagram of the setup.

My Observations and Diagram of Experimental setup:

My Conclusions:

Q2. **Hans Christian Oersted**, a physicist and chemist, conducted an experiment in 1820 to learn more about magnets. Follow the method below, **record your observations** and use these observations to **draw a conclusion**.

Equipment: 1.5V battery; Compass print out; Compasses (2 or 3); 1 copper wire; Connecting wires with crocodile clips

Method:

1. Place the compass print out flat on the desk.
2. Lie the compasses on top so that they are pointing North on the compass print-out.
3. Connect the copper wire to the battery using the wires with crocodile clips.
4. Position the copper wire vertically and lying above the compasses.
5. Record your observations.
6. Carefully position the copper wire vertically and lying under the compasses.
7. Record your observations.
8. Sketch a diagram of the set-up

My Observations and Diagram of Experimental set-up:

My Conclusions:

Q3. Combining what you have learned about magnets and electricity from Q1 and Q2 **describe the connection** (if any) that you have observed between electricity and magnetism. You may add diagrams to help explain your thinking.

Q4. Examine the images and apply your new knowledge about magnetism and electricity to **describe any features** you can see in the images.

Image 1 (Photosphere)

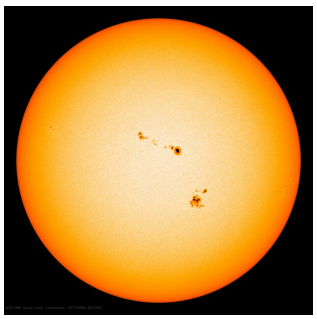


Image 2 (Photosphere)

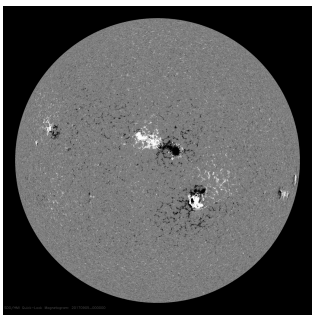


Image 3 (Chromosphere)

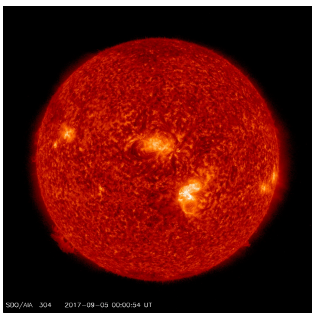


Image 4 (Transition Region)

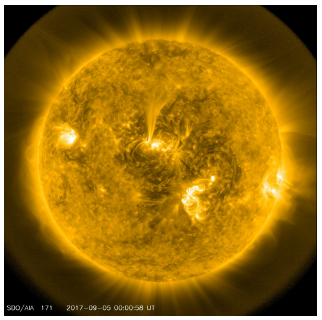


Image 5 (Corona)

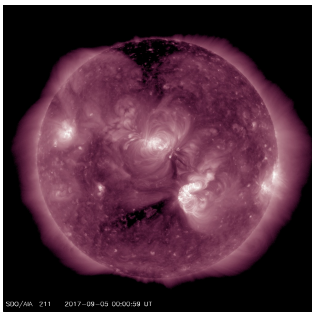
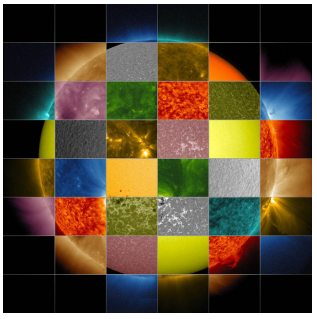


Image 6



Each image was taken on the same day but with a different type of camera, looking at a different layer of the Sun. Image 1 and 2 are the surface (Photosphere), Image 3 is the lower atmosphere (Chromosphere), Image 4 is the transition region between the lower and upper layers (Chromosphere to Corona) and Image 5 is the upper atmosphere (Corona). Image 6 shows the whole Sun with sections taken with different cameras - this shows why the images are all different colours!

Q5. Using everything you have learned about magnetism and electricity, **what do you think would happen** if you could set up the circuit and compasses from Q2. near the loops visible on the Sun (images Q4)? Would the compasses act in the **same way or a different way** to what you observed in Q2?

Q6. In worksheet 1.4 you learned about how atoms of Hydrogen and Helium collide with each other and lose electrons (forming ions). These ions have a charge and are moving around in the Sun. How would you **describe** moving charges? How are the moving charges **affecting the loops** you can see in the images (Q4)?