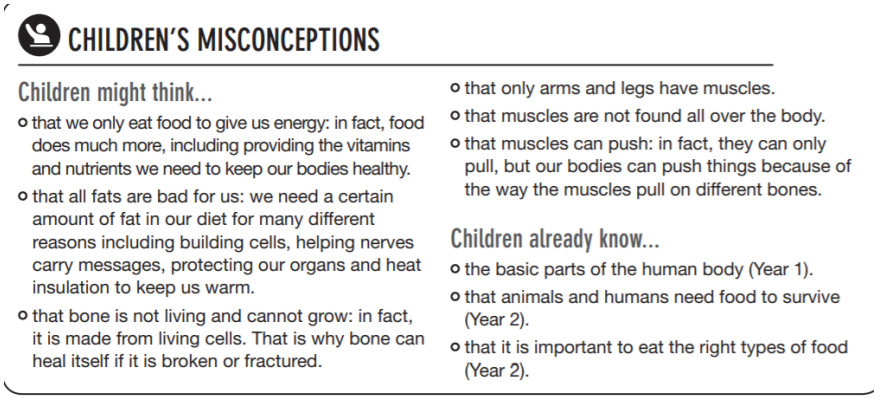
Animals including humans

Identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat

Identify that humans and some other animals have skeletons and muscles for support, protection and movement.

Children's Misconceptions



CHILDREN'S MISCONCEPTIONS

Children might think...

- that we only eat food to give us energy: in fact, food does much more, including providing the vitamins and nutrients we need to keep our bodies healthy.
- that all fats are bad for us: we need a certain amount of fat in our diet for many different reasons including building cells, helping nerves carry messages, protecting our organs and heat insulation to keep us warm.
- that bone is not living and cannot grow: in fact, it is made from living cells. That is why bone can heal itself if it is broken or fractured.
- that only arms and legs have muscles.
- that muscles are not found all over the body.
- that muscles can push: in fact, they can only pull, but our bodies can push things because of the way the muscles pull on different bones.

Children already know...

- the basic parts of the human body (Year 1).
- that animals and humans need food to survive (Year 2).
- that it is important to eat the right types of food (Year 2).

Working scientifically

- asking relevant questions and using different types of scientific enquiries to answer them
- setting up simple practical enquiries, comparative and fair tests
- making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers
- gathering, recording, classifying and presenting data in a variety of ways to help in answering questions
- recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables
- reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions
- using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions
- identifying differences, similarities or changes related to simple scientific ideas and processes
- using straightforward scientific evidence to answer questions or to support their findings.

Key words:

Year 3 Science Planning – Animals including humans

		You can download a Word mat of essential vocabulary for this topic from *My Rising Stars*. **balanced diet:** a diet that has the right amount of nutrients **biceps:** a large muscle at the front of the upper arm **carbohydrates:** nutrients found in sugary foods such as sweets or starchy foods such as potatoes and pasta; these provide energy **contract:** when a muscle gets shorter and pulls **relax:** when a muscle stops contracting **exoskeleton:** a skeleton that some animals have that is outside their bodies like a suit of armour **fats:** nutrients found in foods such as butter; these give you energy and insulate your body	**femur:** the long bone at the top of the leg **humerus:** the long bone at the top of the arm **joint:** where bones meet; there are different types of joint that can move in different ways to make the body move **muscle:** special organs that can contract and relax **nutrients:** useful substances found in foods **protein:** nutrients found in foods such as fish, used in your body for growth and repair **skeleton:** supports and protects the body, allowing movement **triceps:** a large muscle at the back of the upper arm **vertebrate:** animal with a spinal column or backbone including mammals, birds, amphibians and fish
Lesson Number	Focus and Success Criteria:	Lesson Plan	Resources
1 and 2	Focus: To identify that humans and some other animals have skeletons for support, protection and movement.	Part One Hook: https://www.youtube.com/watch?v=cLi55MV04a8 After watching the video, what do the children know? Discuss how bones have scientific names and not just 'ankle' bone or 'leg bone'. Can the children name any of the bones already? Hook 2: Bringing out the skeleton!! Draw around a person on a large piece of paper. Can the children draw and label the bones? After chn have done this, use sticky notes to stick the names of the bones on the skeleton. Photograph their drawings and the labelled skeleton. Subject Knowledge Em. Children are able to name some basic parts of the body and point to them, e.g. head, leg, arm. Exp. Children name and position a range of bones / body parts taught at Key Stage 1. Exc. Children are able to name, position and explain the function of some bones, e.g. ribs.	

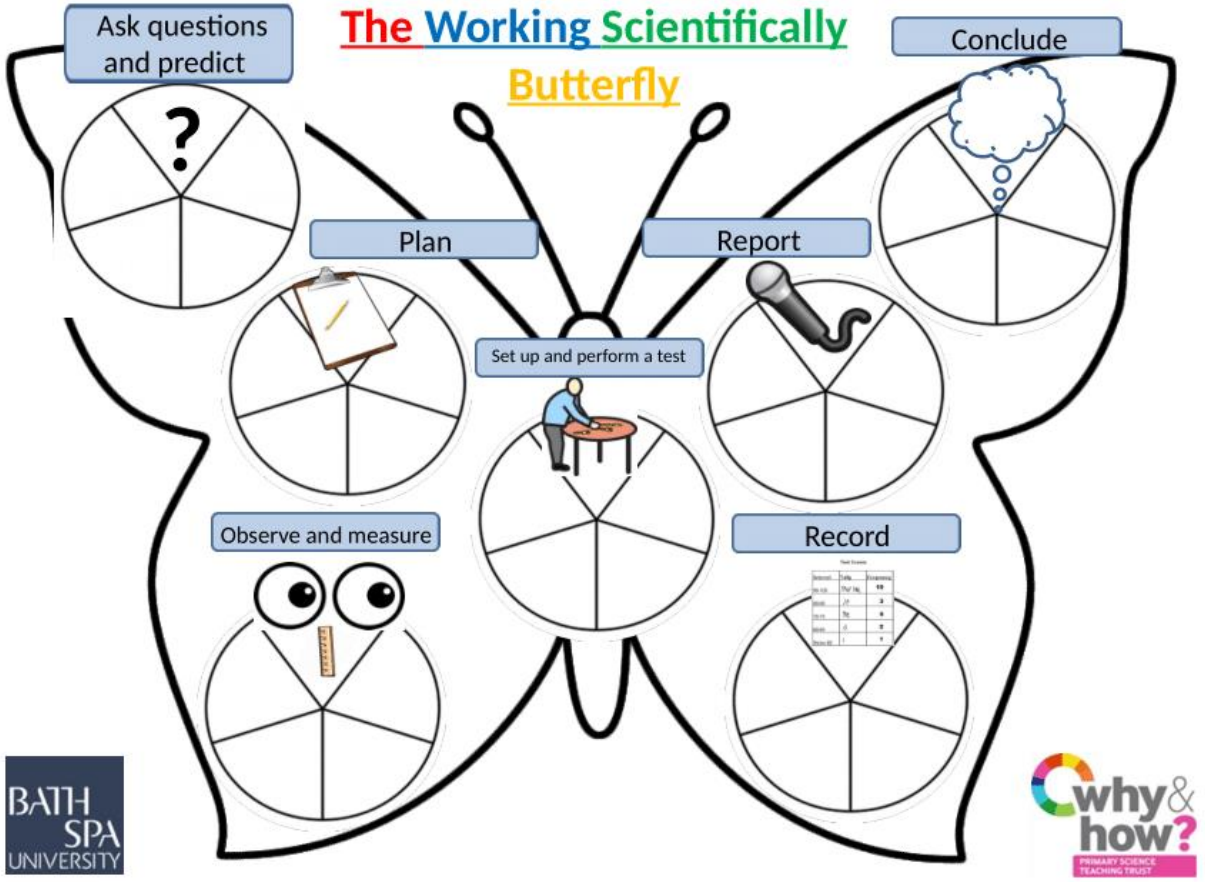
		Em. Children state that they have a skeleton and need support to explain why. Exp. Children know the difference between animals that are vertebrates and invertebrates. Exc. Children explain using a range of scientific vocabulary, e.g. invertebrates, vertebrates, skeleton, internal and external. Complete own independent activity of labelling a skeleton.	
3&4		**Protecting our bones** Part one Ask children to pair up and discuss the vital jobs that skeletons do. Why do they think we have them? Note children's responses so that you can use these to reinforce that: bones help to keep us upright: we would be floppy like jelly without them they help use to move (along with muscles) they protect some parts of the body, e.g. brain, heart and lungs. To help children understand how the skull protects the brain, show PowerPoint Slide that shows what the brain looks like and ask children to think about what their brain is like, why the brain is important and why it needs a skull for protection. Then give them some jelly to put into a small plastic container representing the skull and then ask them to put some on a paper plate. Ask children to shake the jelly on the plate and the jelly in the container. What happens to both lots of jelly? Ask children what the container does that the plate does not, i.e. it is like our skulls or ribs, protecting our soft, squishy bits like our brains, heart and lungs. Ask children to stand in different poses of their choice. For instance, they could balance on one leg with their arms outstretched. Then ask them to think about what it is that is keeping them upright, i.e. that our skeleton supports the whole body. Em. Children can say that they have a skeleton and need support to explain why. Exp. Children know why humans have a skeleton and can use the jelly activity in their explanation. Exc. Children explain using a range of scientific vocabulary, e.g. skeleton, organs, protect, support. Part Four	Science day

		Show children pictures of animals with exoskeletons on. Explain that these animals do not have skeletons inside like we do, but do have hard shells. You could also reveal that some animals do not have skeletons at all! Children to sort animals in to categories. L.O. Identify that humans and some other animals have skeletons and muscles for support, protection and movement. Show children pictures of animals with exoskeletons on. Explain that these animals do not have skeletons inside like we do, but do have hard shells. You could also reveal that some animals do not have skeletons at all! Then, in groups, identify and group animals with skeletons on the outside, with skeletons on the inside and without skeletons at all. At this point children could go out into the school grounds to search for invertebrates and ask children to find, identify and name the invertebrates using their knowledge from Key Stage 1. Use the interactive activity (on My Rising Stars) to help consolidate learning.	
5&6	Focus: To identify that humans and some other animals have muscles for movement.	PE LESSON – Carry out a range of activities e.g. running, jumping, throwing, climbing and balancing. Which muscles are they using? Chn will identify arm and leg muscles but encourage them to think about other muscles that are being used. Introduce the term muscles and discuss what they know. At this stage, children are likely to know about muscles in their arms and legs, so get children to bring their hand up to their shoulder so that they can feel and see their arm muscle. Get children to move a knee to their chest and feel the leg muscles moving. The key to understanding is that bones support the body and it is muscles that help bones to move. Extend understanding to include the idea that there are muscles all over the body, including in the face. Ask children to smile and tell them it takes more muscles to frown than it does to smile. Ask them to think about this and locate different muscles in the body. Ask children to work in pairs and think about which muscles they use when they stand, sit, hop, jump on the spot. Further develop understanding by giving children time to engage in different activities and, as they do, to think about which muscles they are using. Towards the end of the lesson children work	

		individually or in pairs to make a sequence of activities where they use different muscles, e.g. arms, legs, stomach. Em. Children can point to muscles in the arms and legs. Exp. Children are able to indicate where there are different muscles in the body. Ex. Children apply what they know about muscles to explain that muscles are needed to make bones move. Part Two Lots of children will make 'big muscles' to show how strong they are, so take advantage of this and ask children to do this and watch what happens to their upper arm. Ask them to repeat it but this time observe vary carefully and make links between what happens as they raise their hand towards their shoulder and the upper arm. Ask children to share their observations with each other and then bring this together with the whole class. Repeat this but tell children to observe what happens when they lower their arm. Ask children to hold their right arm out straight in front of them, palm up. They then put their left hand on their upper arm. Next, they bring their arm up and feel what happens to the muscle as they do. Ask them to describe their observations to a partner. What do they think is making their arm move? Listen to their responses to see which children are developing an understanding of muscles making their arm move and what happens when they move their arm up and down. Begin to introduce the idea that muscles work in pairs and ask children to feel the muscle at the front of the arm and at the back. Use PowerPoint Slide to illustrate what happens. Children may need a lot of exposure to this idea because, although they can feel what is happening, they cannot see under their own skin. Muscles can only pull, they cannot push. Ask children to once again move their hand towards their shoulder; the muscle at the front (biceps) gets shorter (contracts) as it is pulling the arm upwards. Tell them to do this again but this time feel the muscle at the back (triceps); this stretches (it relaxes). When they put their arm down the muscle at the back (triceps) contracts and the muscle at the front (biceps) is stretched (relaxes). Give children time to repeat this again with each child explaining what is happened to their partner. In pairs, children hold their partner's upper arm as they move it up and down and explain to each other what is happening. This might seem repetitive but it is important that children match language and experience	

		Em. Children can show their upper arm muscles working. Exp. Children are able to demonstrate and describe what happens to the muscle when they move their arm. Ex. Children use scientific language to explain that muscles work in pairs and how the muscle in their upper arm works. <u>Part Three</u> Explain to children that they are going to make a model arm to show how muscles work. Show children PowerPoint Slide 21 and discuss how they think this model is made. Use two lengths of stiff card fixed at one end with a paper fastener. Then add elastic bands to act as the biceps and triceps muscles. Ask children to observe what happens when you pull on the biceps and what happens when you pull on the triceps. Explain that one muscle pulls the arm up, and the other pulls the arm down. Remind children that muscles only ever pull, they cannot push. Once children have completed their model, ask them to think about and jot down the scientific words they need to use to explain how their model works; their list should include: Muscle Triceps Biceps Contract Relax Arm Up Down Move Model Work Then ask them to demonstrate and explain to their partner how the model works, using as many of the scientific words on their list as possible. Partners listen and peer assess, offering constructive comments to their partner. Once this is complete, children could glue their model into their book and write their explanation using scientific vocabulary, paying attention to making sure they apply their literacy. Working Scientifically Em. With support, children are able to make the model and label different parts. Exp. Children make and label the model and are able to explain how muscles work to a partner. Exc. Children can give oral and written explanation using scientific vocabulary and give constructive feedback to a partner Part Four Show children PowerPoint Slides and discuss the different joints and how they work. Then take children into the school hall or outside and ask them to bend their bodies in as many different ways as possible, such as bending over, down, bending knees at the hips, elbow, ankle, wrist. Then ask them to repeat this but in slow motion so that they can locate the joint that allows parts of the body to bend. If tablets are available, children video their partner or someone in the group bending and saying where the joint is, e.g. ankle, elbow. If outside, children draw round one child in their group and locate joints and put circles around them. If they know the name of these joints, e.g. knee, ankle, neck, hips, they could label these. For each joint they label, they write a description of	

		the kind of movement each one allows, e.g. backwards, forwards, side to side. Do they think all joints allow each part of the body to move in the same way? Why? Back in the classroom, tell children that there are different kinds of joints, such as: hinge ball and socket sliding. Em. Children can name basic joints, e.g. elbow, wrist, knee. Exp. Children know that joints allow parts of the body to move. Exc. Children are able to explain how different joints work. Working Scientifically Em. Children can show someone where their joints are. Exp. Children can research and choose how to tell others what they have found out. Exc. Children choose how to communicate their research and are able to compare different joints.	
Extra		Children to write a non-chronological report about humans – include what they should eat, skeletons and muscles.	



Working scientifically butterfly.