Subject: Science Year 3: Movement and Nutrition

NC/PoS:

- 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.

Prior Learning (what pupils already know and can do)

Before starting this unit, check the children can recall the following key facts from the units *Science, Year 2, Animals: Life cycles and health* and *Science, Year 2, Animals: Habitats*:

- Living things need air/oxygen, food/nutrients and water to survive.
- The life processes include movement, reproduction, sensitivity, growth, excretion and nutrition.
- Carnivores are living things that get their nutrients by eating animals; herbivores are living things that eat plants; omnivores eat both animals and plants to survive.

All animals produce offspring. All animals need food, water, air, shelter. Know exercise is important. There are different types of food: dairy, fruit and vegetables, carbohydrates, fats, and proteins. know important to eat a variety of food and have good hygiene

End Goals (what pupils MUST know and remember)

- Know the right food is important for a healthy body
- Know animals, get their nutrients from what they eat
- Know all animals, need the right amount of nutrients from the food they eat
- Know carbohydrates and fats provide energy, proteins help with growth and repair, vitamins and minerals keep cells healthy, fibre helps food move through the gut and 70% of the body is water
- Know the skeleton does three jobs: protecting the body parts, supporting the body, and letting the body move.
- Know bones, have joints so the skeleton can bend.
- Know muscles and joints allow movement
- Know muscles are soft tissues that are joined to bones and always work in pairs.

Key Vocabulary: muscles, tendons, tissue, skeleton, protective, support, vertebrates, ribcage, sternum, pelvis, spine, endoskeleton, exoskeleton, serving, balanced diet, healthy, nutrients, carbohydrates, fibre, vitamins, minerals, fats, protein

Session 1:

Use resources from Kapow Lesson 1: Skeletons

Recap and recall:

- Living things need air/oxygen, food/nutrients and water to survive.
- The life processes include movement, reproduction, sensitivity, growth, excretion and nutrition.
- Carnivores are living things that get their nutrients by eating animals; herbivores are living things that eat plants; omnivores eat both animals and plants to survive.

LO: To explain the role of a skeleton.

Working scientifically LO: To group animals based on their physical properties.

Also look at skeletons of a variety of animals and group them

Discuss that not all animals have a bony or hard skeleton; for some, the skeleton is in different body parts. Display slide 1 of the *Presentation: Animal skeletons,* clicking to reveal the meaning of each word displayed.

Arrange the class into pairs and hand out the *Resource: Sorting animal skeletons* (one between two, pre-cut and shuffled). Ask the children to:

1. Group the animals based on whether they think they are vertebrates or invertebrates.
2. Sort the invertebrate group into exoskeletons and no bony skeleton.

N.B. An endoskeleton is an internal skeleton like in vertebrates. An exoskeleton is the external skeleton that supports and protects an animal's body like in ants, bees, crabs endoskeleton, exoskeleton

Use the *Resource: Questions about skeletons* and ask the children to think about the questions as they watch the video. Play the link: The skeleton on VideoLink to introduce the three key roles of a skeleton (movement, support and protection). Ask the children to find information from the video to answer the questions. Feedback and collect answers on whiteboard as a class. Children write some facts about skeletons in their Science books: must include the 3 key roles of the skeleton:

a) to support the body
b) protect the organs
c) help the body to move

Vocabulary: bone, endoskeleton, exoskeleton, invertebrate, joint, movement, protection, skeleton, spine, support, vertebrate, ribcage, skull, pelvis

Session 2:

Use resources from Kapow Lesson 2: The bones in our body

Recap and recall: What are an exoskeleton and endoskeleton? What is their function?

LO: To recognise the main bones in the body.

Using pre-prepared sticky notes (skull, spine, ribs and pelvis) discuss the correct location for the labels (see Kapow Teacher knowledge). Children stick them in the correct place on an outline of one of the children or on the *Presentation: Blank skeleton*

Display the link: Siemens - The Human Body and select 'skeleton' to explore different views of the key bones (skull, spine, ribs and pelvis).

Play the 'Build a skeleton' game as a whole class- rolling a dice and guiding the children to correctly build their skeleton.

In their books, children list the main bones in the body mentioned above, where they are found and their function.

Vocabulary: joint, pelvis, skull, ribs, spine

Session 3:

Use resources from Kapow Lesson 3: Muscles and Movement

Recap and recall: Children to think of questions that would result in the word 'movement'

LO: To explain how muscles are used for movement.

https://www.youtube.com/watch?v=3haTJCOkyxA how bones and muscles work

https://www.bbc.com/bitesize/articles/zpbxb82 - how do your muscles work

Muscle is a soft tissue that produces force and motion and maintains the position of parts of the body.

Muscles are joined to bones by tendons. Using the *Pupil video: Elbow joint in action*, show the pupils how the biceps and triceps work to contract and pull the elbow into opposing positions.

Children write a short explanation about how muscles work using diagrams if necessary.

Vocabulary: muscles, tendons, tissue, joints

Session 4:

Use resources from Kapow Lesson 4: Eating for survival

Recap and recall: This lesson and unit build on knowledge and concepts introduced in the units *Science, Year 2, Life cycles and health* and *Science, Year 2, Habitats big and small*.

Ask the children:

- **What do we mean by diet?** (The type of food that an animal usually eats.)
- **What is included in a food chain?** (Producers at the start; arrows moving up the food chain; no more than three or four living things named; each living thing eats the one before it.)

- **Why do you need to eat?** (We cannot make our own energy source like plants; nutrients are necessary for our body to work.)
- **What are the similarities and differences between a carnivore, herbivore and omnivore?**

LO: To explain how food is an essential energy source for animals.
Remind the children that animals are consumers, meaning they need to eat food to get the energy and nutrients needed to survive. Encourage the children to consider that not all animal diets are the same.
Use an A3 version of the *Activity: Matching energy needs* to complete as a class and stick in the class floorbook. Use the *Presentation: Energy needs* to check answers.
Distribute a range of food packaging on the children's desks and ask them to find the energy values, particularly the kilocalories (kcal). Whether they are looking at a value per 100 g or per serving at this stage does not matter.
Children look at which, or how much, food they would need to eat to have the energy required for certain activities and record in books.
Vocabulary: energy, kilocalories

Session 5:
Use resources from Kapow Lesson 5: Nutrient groups
Recap and recall: Display the *Presentation: Anagrams about food* and ask the children to unscramble the letters to reveal key vocabulary in the unit:

- **Energy:** used by living things to grow, survive and stay healthy.
- **Carnivore:** a living thing that only eats animals.
- **Food chain:** a sequence of living things, where each eats the living thing before it and is eaten by the living thing after it.
- **Balanced:** a diet that includes all seven nutrient groups in the right amounts.
- **Omnivore:** a living that eats both animals and plants.
- **Diet:** the type and amount of food and drink that a living thing usually consumes.
- **Nutrient:** a substance that is essential for survival or growth.
- **Herbivore:** a living thing that only eats plants.

LO: To identify the main nutrient groups and their simple functions.
Display slide 1 of the *Presentation: Nutrient groups*, showing the seven nutrient groups.
Seven types of nutrients:

a) Water – essential for survival, makes up 60% of human body
b) Carbohydrates – gives animals energy and prevents loss of muscle mass
c) Protein – building blocks for cells and essential for forming muscles
d) Fats – boosts absorption of vitamins and protects the organs of the body
e) Vitamins – help the bones grow and support the immune system
f) Minerals – helps the body to work properly
g) Fibre – helps the digestive system stay healthy

Use the *Resource: Nutrient group information* and have A3 versions displayed around the room; children collect the information they need to make notes about each nutrient group. There is a scaffolded version if needed to support.
Vocabulary: balanced diet, carbohydrate, energy, fat, fibre, mineral, nutrient, protein, vitamin, water

Session 6:
Use resources from Kapow Lesson 6: Balanced diets
Recap and recall: Display slide 1 of the *Presentation: Nutrient or food group?* and ask the children to decide if each example is a nutrient or a food group. Take feedback and ask the children to identify why each nutrient is needed in the body.
LO: To explain what makes a balanced diet.
Science in Action: To explore how knowledge has progressed over time and how different jobs use this information.
Display the *Presentation: Nutritionists throughout history.* Discuss how research over time

has led to current knowledge of nutrition and diets.
Play the following videos:

- Link: BBC Bitesize - A healthy plate, looking at the role of a catering supervisor.
- Link: BBC Bitesize - Food energy, showing an interview with a sports nutritionist.

Explain to the children that they will pretend to be nutritionists and plan a balanced meal. Children draw a plate in their books and draw and label foods on the plate to create a balanced meal. A balanced diet is one that that contains the right nutrients in the right quantities, and should include carbohydrates, proteins, fats, minerals, and vitamins.
Vocabulary: balanced diet, carbohydrate, energy, fat, fibre, mineral, nutrient, protein, vitamin, water

Link to career scientist:
https://pstt.org.uk/application/files/3516/4572/2477/Protein_Biochemist_-_Dr_Gulin_Guler-Gane_-_v2.pdf
Orthopaedic doctor https://www.youtube.com/watch?v=6O4BM53cjSk

Scientists who have helped develop understanding in this field: Leonardo da Vinci made first anatomical drawings.
https://pstt.org.uk/application/files/3516/4572/2477/Protein_Biochemist_-_Dr_Gulin_Guler-Gane_-_v2.pdf
Show De Vinci's Vitruvian Man – anatomical drawing of human body.
He was fascinated by nature and spent time studying the human body.