

## GROWING UP (LEVEL 2)

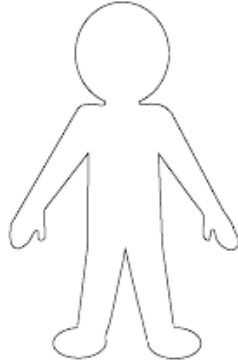
<b>Description</b>	Learners will explore the human body including movements of the skeletal structure, organs, exploring the five senses, doing some physical activity and observing some of our magical bodily functions
<b>Leading Question</b>	How do we change as we grow?
<b>Total Time Required</b>	~5 hours over 5 days
<b>Supplies Required</b>	Paper and Pen, cloth or water and flour, toothpick or straw, small glass object, balloon (optional)
<b>Learning Outcomes</b>	<ul style="list-style-type: none"> <li>• Understanding the role of bones in protecting, moving and supporting the body</li> <li>• Label a human skeleton with some of its major bones (e.g. Skull, ribs, knee caps, and pelvis).</li> <li>• Examine how exercise affects heart rate and pulse.</li> <li>• Identifying different body parts and human anatomy</li> <li>• Sensing the differences in the body due to exercise and stress</li> <li>• Human growth and development</li> </ul>
<b>Previous Learning</b>	<ul style="list-style-type: none"> <li>• Knowledge of the body parts including knee cap, shoulder girdle, pelvic girdle, elbow joint, spine etc.</li> </ul>

## DAY 1

Today you will learn about your skeletal structure!

<b>Suggested Duration</b>	<b>Activity and Description</b>
<b>15 minutes</b>	<ul style="list-style-type: none"> <li>• Begin by drawing a self-portrait of their body as a blank figure and label all the body parts that they are familiar with – you can use the template below. Fold in the piece of paper from both sides to form a door like a cupboard. On the top of the folded section draw your own blank figure on the cover half on either side of paper and mark the limbs and label the different parts of their arms and legs</li> </ul>

including thigh, ankle, toes, heel, fingers, thumbs, wrist and elbow etc. Illustrate all the functions that our limbs help us with for example: arms and fingers help us hold things, feed ourselves, and write etc. legs help us walk, run, jump etc.



- Explore some of the main functions of the skeleton including support, movement and protection.

**15 minutes**

- Let's start with the support the skeletal structure provides. Imagine a building without pillars or columns – that is what would happen to our body without a skeletal structure.

**15 minutes**

- Try and cut out a human figure with cloth (skin) or make one with dough (flour and water) or a 2D paper figure – this is what our muscles and skin would be like without a skeleton or bones. How would this stand up without a skeletal structure?



**15 minutes**

- Create a skeletal structure for your paper or cloth figure.
- Use toothpicks or straws to create a strawman that stands and drape the cloth on that or create a stand and make the paper figure stand. The skeleton provides the core structures.
- One of the main parts of our skeletal structure is our backbone or vertebrae that helps us stand up straight. Touch your backbone or that of your family to understand how it extends from their hip all the way up to your neck.
- All animals including human beings that have the backbone are called vertebrates. Imagine animals that do not have a backbone or skeleton – they are called invertebrates – you can try and guess and name three animals that do not have backbones and instead have soft bodies like worms, jellyfish or harder outer casing exoskeleton like a spider etc. which have an external skeleton outside of their bodies unlike humans. Draw these different animals!

## DAY 2

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Today you will continue exploring the skeletal structure and movement!

Suggested Duration	Activity and Description
20 minutes	<ul style="list-style-type: none"> <li>● Let's begin with our knee joint – we can straighten our legs and fold them backward when we sit on our knees.</li> <li>● Let's try a few yoga poses to explore this range of motion with your knees:               <ul style="list-style-type: none"> <li>- Try a chair hold position: imagine you are sitting on a chair without there actually being a chair – for how long can you hold that position? Try 60 seconds.</li> </ul> </li> </ul>
	
	<ul style="list-style-type: none"> <li>- Try a tree pose: Stand straight and fold your hands and extend over your head. Now lift one leg and bend it and place it on the other leg. Try and balance on one leg for 30 seconds. Now change the leg</li> </ul>
	
	<ul style="list-style-type: none"> <li>- For a challenge, gradually straighten the bent leg and hold onto the toe, while continuing to stand on one leg</li> </ul>



- Sit on the ground and keep both your legs straight and touch your toes by reaching out. Now bend one knee and reach forward to touch your head to the knee of the leg that is straight.



- For a challenge, stand on leg and extend the other leg straight behind you – lean forward so that your body makes a T. Can you hold this position for 60 seconds?



- This range of motion of the knee joint is similar to another joint – can you guess which one it is? (Hint: think of the similar joint as the knee in your other limbs – the elbow joint.)

**20 minutes**

- Challenge yourself to make up your own yoga asana's and try and spell all the letters of the alphabet while lying down with your legs in the air or while standing with your whole body. E.g. while lying down, you can join your heels together in the air to form a triangle or an A shape with your legs, etc.

**20 minutes**

- Now you will explore our multi-axial joints, which are joints that allow us to move in different directions and have a broader range of movement. We will be exploring the hip or pelvic girdle. A girdle is a structure containing many bones and joints. Guess the number of movements that are possible in the hip area, and then draw a diagram for each while trying these. Following this you can try the

six motions that the hip joint allows us: move the leg forward and backward, out and in sideways and also rotate it open. Let's try some yoga positions for these movements

- Standing in your place, lift one leg in the air and swing it forward and backward. To make this position more challenging, we can try and hold the toe of the leg lifted off the ground.



- Lying on your side on the floor try lifting the leg on top upward and downward without bending the knee. Try doing this movement 20 times.



- Finally, sit in a butterfly position or cross-legged on the floor.



**10 minutes**

- The shoulder girdle is similar to the hip girdle –make up 3 – 4 of their own exercises for the shoulder girdle to explore the range of motion (Hint: you can lift your arms up in the air and stretch, to the side and over your body and bend, rotate your arms etc.)

**20 minutes**

- Numeracy extension: draw and then form the three kinds of triangles with their arms and shoulders i) A right angle triangle like

an L with their hands, ii) An equilateral triangle with all the sides being equal and all the angles being 60 degrees, iii) An isosceles triangle where 2 of the sides are equal etc. Hint:



- Design a small yoga guide for your family with the yoga asanas you designed describing the importance of the skeletal structure for movement.

## DAY 3

Today you will continue learning about your body.

### Suggested Duration

15 minutes

### Activity and Description

- Think of the protection offered by the skeleton by designing your own heart made of glass, your own brain made with dough and or lungs made by balloons or inflated water or air filled plastic bags. You can paint a small glass object or wrap it with red paper as the

	heart, you can make a brain using dough and blow up 2 plastic bags with air as lungs
<b>5 minutes</b>	<ul style="list-style-type: none"> <li>Think about how to protect these organs given how delicate glass, dough or plastic is? You will need to design the protective bone structure e.g. a helmet that represents the skull to protect the brain, a storage box or Tupperware bottle that represents the rib cage within which the lungs and heart is safe</li> </ul>
<b>5 minutes</b>	<ul style="list-style-type: none"> <li>Write about and draw the skeleton and how it protects the different organs including: <ul style="list-style-type: none"> <li>The skull protecting the brain</li> <li>The vertebrae protecting the spinal cord</li> <li>The ribcage, spine and sternum protecting the lungs and heart.</li> </ul> </li> </ul>
<b>5 minutes</b>	<ul style="list-style-type: none"> <li>Breathing: you will first take notice of your breathing. Close your eyes and count their breaths within a minute. Notice your stomach and chest rising and falling placing their hand on their stomach/</li> </ul>
<b>5 minutes</b>	<ul style="list-style-type: none"> <li>Pulse: you will place your thumb your wrist until you can feel your pulse. Count the number of times your pulse beats in a minute.</li> </ul>
<b>5 minutes</b>	<ul style="list-style-type: none"> <li>Now do some exercise and think about the reactions that your body has after 50 jumps or jogging on the spot.</li> </ul>
<b>10 minutes</b>	<ul style="list-style-type: none"> <li>Think about the reactions that your body has when it is under stress or exercising. E.g. breathing, pace of the pulse rate, sweat, etc.</li> </ul>
<b>15 minutes</b>	<ul style="list-style-type: none"> <li>Numeracy extension: Compare the number of breaths you took within a minute in a resting state and after exercise. If you took 55 breaths per minute before exercise and 80 breaths per minute after the exercise, how many breaths did you take per second pre and post exercise? What is the percentage difference in the number of breaths post and pre exercise?</li> <li>Compare the number of pulse beats in a resting state and after exercise. Calculate the number of pulse beats per second pre and post exercise. Calculate the percentage difference in their pulse rate</li> <li>Calculate the number of jumping jacks per 1 minutes and then calculate the number of jumping jacks per second e.g. if you can do 50 jumping jacks per minute, how many jumping jacks can you do every second?</li> </ul>

## DAY 4

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Today you will become a doctor and do a health check up on your family!

Suggested Duration	Activity and Description
20 minutes	<ul style="list-style-type: none"> <li>Assume the role of an ophthalmologist or eye doctor and check their family member's eyesight. Design your own reading chart with 35 words. Divide this with 5 words on each of the 7 rows. Reduce the size of the words on each row from large to very small in the last row as shown in the image below. Write words instead of letters:</li> </ul>
20 minutes	<ul style="list-style-type: none"> <li>Hold the eye test chart at a distance and ask your siblings, parents and grandparents to read the chart. Read 2 of the letters on each row with one eye closed and the other 3 words with the other eye closed.</li> <li>Write a few sentences diagnosing family members and comparing their eyesight, including the details of what they were able to read or not.</li> </ul>
15 minutes	<ul style="list-style-type: none"> <li>Now assume the role of a physiotherapist and check on the flexibility and range of motion of their family members. Lead a yoga session with their family members and check on the how many of the movements they are able to do and with what level of ease</li> </ul>



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<ul style="list-style-type: none"> <li>● Write a diagnosis for your family members on what positions they are able to do.</li> </ul>	
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<p><b>15 minutes</b></p>	<ul style="list-style-type: none"> <li>● Finally, let's test the ability of your family members to do exercise.</li> <li>● Try the same exercises and yoga asanas with your family members – including your grandparents, parents or siblings to observe the different range of motion and flexibility for different members of the family and the impact of exercise on them.</li> <li>● Now, lead an exercise session with the family and measure their pulse rate and body temperature before and after exercises</li> <li>● Note: it is important to moderate the exercise for older family members depending on their health conditions and age</li> <li>● For younger and fit family members they can do jumping jacks, mountain biking, jogging on the spot etc. For older family members and those with health issues they can do brisk walking.</li> </ul>
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<p><b>10 minutes</b></p>	<ul style="list-style-type: none"> <li>● Observe and write a report of the impact of the exercise on each of the family members and ask them how the exercise made them feel immediately after the exercise and later in the day.</li> </ul>
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<p><b>15 minutes</b></p>	<ul style="list-style-type: none"> <li>● Literacy extension: Ask family members about any health conditions and write a report on what these health issues are, what aches and pains it results in, how this health condition affects their daily life and how they are currently treating it.</li> </ul>

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## DAY 5

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Today you will put together everything you learned and think of their skeletal structure, their senses, and of how they grow by illustrating five stages of life.

<b>Suggested Duration</b>	<b>Activity and Description</b>
<p><b>25 minutes</b></p>	<ul style="list-style-type: none"> <li>● The first stage is a baby at birth. Draw yourself as a baby or a baby they are familiar with (siblings, cousins etc.) and describe the movements and senses. Check one of your baby pictures for reference.</li> <li>● Describe what you are able to do back then with reference to limbs. Were you able to walk with your legs and hold things with your hands? Did your body have the same range of motion and flexibility?</li> </ul>

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	<ul style="list-style-type: none"> <li>Describe your senses as a baby. Did you know that babies are not born with the same eyesight as we have now – they are unable to see all colors or see things that are at a distance? Given the eyesight of babies, how do you think they are able to recognize their mother and find a source of milk? Did you know that babies can recognize their mother’s voice from when they were in the womb?</li> </ul>
<b>15 minutes</b>	<ul style="list-style-type: none"> <li>Now draw an image of themselves at their current age at the childhood phase.</li> <li>Describe your flexibility now and range of motion with relation to the limbs. Also describe the senses.</li> </ul>
<b>20 minutes</b>	<ul style="list-style-type: none"> <li>Draw an image of your parents or another adult in your family at adulthood. How different do they look and what physical changes do you observe?</li> <li>Describe their flexibility and range of motion with relation to the limbs. Also describe their senses e.g. are they beginning to need spectacles etc.? Also describe any chronic health issues that are beginning to appear at adulthood.</li> </ul>
<b>15 minutes</b>	<ul style="list-style-type: none"> <li>Draw an image of an older person such as grandmother or grandfather in their home. Mark the age range of this family member</li> <li>Describe the strength and flexibility of their limbs. Will they be able to do the same yoga asana’s the same way? Why not? Do they have issues with any of their joints and pains? Why do you think that is?</li> <li>Now do a sensory check on your grandparent, are all their senses as sharp as yours are? Why do you think this is?</li> </ul>
<b>5 minutes</b>	<ul style="list-style-type: none"> <li>Write a short summary of how you think your body changes as you grow through the four stages as your bodies change and age as they grow.</li> </ul>

## ASSESSMENT CRITERIA

- Illustrations and labelling of the paper figure
- Critical thinking in identifying and understanding the senses, limbs and different human body phenomena
- Student engages in scientific questions and justifies their answers related to aging
- Ability to collect information and data on health phenomena and changes pre-post exercise
- Creativity in designing yoga asanas and exercises that explore the range of motions

## ADDITIONAL ENRICHMENT ACTIVITIES

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- Learners can draw a the circulatory and respiratory system

## MODIFICATIONS FOR SIMPLIFICATION

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- Learners can reduce the number of yoga poses and exercises conducted.