



Science Progress Report 2019-2020

Student Name: Arjun Raj

Teacher: Sangeetha Shanker Rao & Aruna Rajaram

	Term I (July – October)			Term II (November – March)		
	Beginning	In Progress	Mastery	Beginning	In Progress	Mastery
Knowledge and Understanding						
Engage in discussions on the importance of questions, evidence and explanations, using historical and contemporary examples.		✓				
Provide explanations based on assimilating previous knowledge, understanding and research.			✓			
Research information through books, videos, and surveys. He/she shows interest to read/listen to facts, instructional texts, and stories.			✓			
Design of Investigations						
Student is able to suggest and use preliminary work to decide how to carry out an investigation.		✓				
Make predictions based on prior knowledge and then evaluate these against evidence.			✓			
Decide whether to use evidence from firsthand experience or secondary sources.			✓			
Plan and carry out own experiments and describe to what extent their plan worked		✓				
Experimental Skills						



Decide which measurements and observations are necessary and what equipment to use.		✓				
Use appropriate sampling techniques where required.		✓				
Obtain and present evidence						
Make sufficient observations and measurements to reduce error and make results more reliable.		✓				
Student makes inferences based on observations. Student distinguishes between observation and inference.			✓			
Analysis, Conclusions and Communications						
Choose the best way to present results in graphs, charts, tables or as explanations.		✓				
Interpret results using scientific knowledge and understanding.			✓			
Look critically at sources of secondary data.		✓				
Describe patterns (correlations) seen in results.			✓			
Explain scientific relationships between parameters.		✓				
Compare results and methods used by others.		✓				
Present conclusions and results completely using scientific terminology and in context.		✓				
Evaluation of methods utilized to carry out investigations.		✓				
Participation in the work						
Student shows interest to log work in notebook or given worksheets			✓			
Homework is completed early or on time and shows careful completion.		✓				
Gathers, organizes, and uses materials as needed. Returns materials and cleans up after self.			✓			



Settles down with ease and stays on task. Student is enthusiastic in class.			✓			
Class work is turned in on time.			✓			

✓* - Indicates with Assistance
 N/A - Not introduced / Not Applicable

Term I

Content Covered:

We began to review and recap the basic concepts that we had for the first two weeks of school in order to slow down and look at the basic work done and the strengthening of the concepts that will help them to connect the higher concepts that they will be working on in the coming terms. This provided them with much ease and got them ready to dive into work this academic year.

We have covered the following concepts in each of the branches of Sciences and each unit of study is undertaken with activities, experiments, presentations and audio-video sessions.

Biology



Wisdom of plants

This section helped draw on the groundbreaking scientific discoveries to describe how trees are like human families, living together with their children, communicate with them, support them as they grow, sharing nutrients with those who are sick or struggling, and even warn each other of impending dangers.

The students reinforce their concept of classification in particular focusing on the plant kingdom and the different classes in them. The students will carry out investigations and experiments to study the below sub topics through investigations and experiments.

Structure and function of plants

Conditions needed for their growth where in we will explore soil chemistry

Adaptations of plants based on biomes

Transport system in plants, here we will bring in comparison with the human transport system the students have already covered earlier

Asexual and Sexual Reproduction in plants

Division of Labour (Structure and function of the brain):

An engaging activity is in understanding how the brain thrives by having sections and areas where work or a function is delegated in order for an organism to be able to perform. We discuss this by having discussions, short video sessions and books that engage the learner in understanding



how the right and the left brains have evolved to do different functions. Through this session they also understand how they can perform better mentally, physically and emotionally.

The students will address this section by exploring the human nervous system, basic structure, types and function of the neuron. The brain is a vast network of neurons but how they communicate with each other is an area of interest and research. The students will look at the nerve impulses, the transmission of these impulses and the pathway of a reflex action based on the impulse. This section also addresses the hormonal system briefly along with the glands that secrete hormones that are needed to keep the balance in our body through Homeostasis.

Structure of the eye

This section helps in understanding the coordination of the eye with the nervous that helps us see. Here we start with a comparison of the eye with a video camera, to study the structure and function of the eye. How we are able to see colours and the role of the lens in helping us see with the changes in light intensity.

Self study chapter: Pathogens and immunity

Chemistry

World of Organic Chemistry

In this section, students will explore the world of carbon. This involves the scientific study of the structure, properties, and reactions of organic and inorganic materials, matter in its various forms that contain carbon atoms. The focus in particular will be in the area of hydrocarbons, types of hydrocarbons namely alkanes, alkanes and alkynes. Their structural understanding that will help a student understand their physical and chemical



properties. Students need to practice how to draw these structures and their bonding. Students will also describe the manufacture of ethanol by fermentation and by the catalytic process.

Alcohol: This section of organic chemistry will also be addressed through global perspective work on biofuels. Students in particular will study the properties of ethanol in terms of burning, its uses as a solvent and as a fuel.

Carboxylic acids: In this section of organic chemistry students will study the making and properties of aqueous ethanoic acids and its uses.

Petro chemicals

In this section students will study the following concepts and will be reinforced in their work through global perspectives.

- (a) What are fossil fuels and how are they formed
- (b) Formation of coal and their uses
- (c) Formation of crude oil, extraction of crude and processing it through fractional distillation
- (d) Properties and uses of Natural gas, diesel, petrol, kerosene and tar/bitumen

Polymers

In this section students will study a wide range of polymers from familiar synthetic plastics such as polystyrene to natural biopolymers such as DNA and proteins that are fundamental to biological structure and function. Polymers, both natural and synthetic, are created via polymerization of many small molecules, known as monomers. Students will study and outline the typical uses of plastics and of man-made fibres such as nylon and



terylene. We will also focus on the pollution caused due to non-biodegradable plastics through project work based on raising aware and responsible consumers.

Quantitative Chemistry

This section addressed the Mole concept and its application in various industries in setting standardization.

Patterns and reactivity series

This section emphasised the properties of the transition metals in the periodic table and its properties. This section also focused on the reactivity series and its application. We addressed this section through a number of lab activities and investigations.

Physics

The first two months children spent in getting their doubts cleared with respect to all the concepts covered so far. Static Electricity and Magnetism were self study chapters. Children then created activities related to properties of waves and sound to present to sunflower children. They received a lot of appreciation from Sunflower children for the ability to explain in different ways and using fun activities. We then explored the concepts in depth.

1. Properties of waves : Describe a wave in terms of speed, amplitude, frequency and wavelength, difference between transverse and longitudinal waves, calculating wave speed, describe and explain the difference between reflection, refraction and diffraction of waves.
2. Sound : Understanding how sound travels, the relationship between pitch and frequency, loudness and amplitude, speed of sound in different materials, use of echolocation by animals, harmful effects of sounds, why certain music is relaxing while others cause stress.
3. Light & Spectra: Review of construction of ray diagrams using practical papers, understanding the importance of measuring angles with accuracy to see the laws of reflection, the difference between reflection, refraction and total internal reflection, understanding critical angle



and refractive index, explaining the working of a magnifying glass using the ray diagrams for lens and differentiating between real and virtual image. Dispersion of light using a prism, understanding the benefits and harmful effects of electromagnetic waves, be able to explain all electromagnetic waves travel at the same speed and hence develop the relationship between frequency and wavelength for these waves.

4. Electric Components: Understanding the importance of using electronic symbols for components, difference between resistors, variable resistors, thermistors and light dependent resistors.
5. Electrical Quantities - The difference between conductors and insulators, understanding what is the relationship between charge, current and time, being able to relate flow of charge to electrons flow and realizing rate of change of flow of charge is current, the relationship between Voltage, Current and Resistance, the factors that change resistance, measuring electric current, voltage and resistance, calculate energy and power in electric circuits.
6. Electric Circuits: Draw simple open and closed circuits, series and parallel circuits, understanding where the ammeter and voltmeter need to be placed in a circuit. Calculating the combined resistance in a series and parallel circuit

Comments:

Areas of Strength

Arjun is an intelligent and an engaged learner in class. He is observant by nature and keenly listens to the perspectives of his peers on a topic. He questions when in doubt but also relies on his own resilience to delve into a topic and try to resolve his doubts. He is able to understand and expand on the topic with ease. He is using the scientific keywords in his written work and as we go ahead we hope that he is able to do so consistently. His inferential and analytical skills are commendable. His logical skill sets are good and this clearly outlines his work to address the physical sciences. He is able to construct and interpret a graph with ease.



His presentation to the class on “ Mole concept” was commendable. His outline of the concept was crisp and clear. It was amazing to see Arjun take the constructive feedback from his peers and implement it on the spot to help them learn with concepts. He supported his presentation with activities and worksheets that were an instant hit with the class.

He has proved that activities and presentations are his strength, he was able to carry out the presentation about properties of wave without his partner and take it to completion as planned. His quick and attention to detail was a hit with the sunflower children, who found the activities simple and easy to understand.

Suggestions for Growth

1. Set pace and plan out the review as we complete the concepts to fine tune on them
2. Slow down read the question, attempt all and present the written work legibly and neatly.