The Whinless Down Academy Progression in Physics
(seasonal change, light, sound, Earth and space)

Level Expected at the End of EYFS - *We have selected the Early Learning Goals that link most closely to the Science National Curriculum.*

Early Learning Goals **-** Children know about similarities and differences in relation to places, objects, materials and living things. They talk about the features of their own immediate environment and how environments might vary from one another. They make observations of animals and plants and explain why some things occur and talk about changes.

Knowledge **-** There are four seasons in the year: Autumn, Winter, Spring, Summer They always come around in the same order every year. The weather changes with the season. In the day time we are awake. At night time we go to sleep. Name different weather types, rainy, sunny, cloudy.

EYFS Vocabulary - *Season, year, Autumn, Winter, Spring, Summer, weather Day, night Rainy, sunny. Cloudy*

	National Curriculum	Knowledge	Vocabulary
Year 1	Children can observe changes across the four seasons. Children can observe and describe weather associated with the seasons and how day length varies.	**Spring** is usually **warmer** than **winter** so things start to grow like flowers on plants and leaves on trees. New animals are born. Spring months are March, April and May. **Summer** is usually the **warmest season**. We have more **sunlight** in the summer and it is light for up to 16 hours. Summer months are June, July and August. **Autumn** is **cooler** than **summer**. There is less light than summer. Leaves begin to change colour and fall from deciduous trees. Some animals begin to hibernate until it becomes warm again in the spring. Autumn months are September, October and November. **Winter** is usually the **coldest season**. The colder weather means that fewer plants grow and many animals are hibernating as they have less food to eat. Winter months are December, January and February. There are always **24 hours** in a day. A weather forecast is a statement saying what the weather will be like today, the next day or for the next few days. Weather forecasts use different symbols which are helpful.	year, months, days, day, night **Seasons:** Spring, Summer, Autumn, Winter Light **Temperature:** Warm, Cold, Cooler **Plants**: Leaves, Deciduous, Hibernate **Weather:** Rain, Sun, Dry, Storm, Thunder, Lightning, Wind, Cloudy
Possible misconceptions: It always snows in winter. It is always sunny in the summer. There are only flowers in spring and summer. It rains most in the winter.			
Year 3	Children can recognise that they need light in order to see things and that dark is the absence of light. Children can notice that light is reflected from surfaces. Children can recognise that shadows are formed when the light from a light source is blocked by an opaque object.	A **light source** is something that makes light. We need **light** so that we are able to see in the **dark**. The dark is the absence of light. The **Sun and stars** give us **light**. (The Moon is not a source of light. It reflects light from the Sun.) Smooth, shiny surfaces **reflect** light well whereas dull and dark surfaces do not reflect light well.	Surface dark, dull, bright, brighter, duller, darker, brightest, dullest, darkest Opaque, translucent, transparent **Shadow** – block, absence of light,

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	Children can find patterns in the way that the size of shadows change. Children can recognise that light from the sun can be dangerous and that there are ways to protect their eyes.	The **transparency** of an object is how much light it lets through. **Transparent** objects let through all light, **translucent** objects let some light through, and **opaque** objects let no light through. When light is blocked by an **opaque** object, a dark shadow is formed. When light is shone onto a **transparent** object, the light travels through it, we can see through it and it makes a very faint shadow. When light is shone onto a **translucent** object, some of the light travels through it, we can see bright light sources through it and it makes a fairly dark shadow. The size of a **shadow** is affected by the positions of the light, object and **surface.** The further away the light source is, the smaller the shadow is. The closer the source of the light, the bigger the shadow. The light from the sun is powerful and very bright. **Sunlight** contains **UV rays** (ultra violet). UV rays can damage and burn our skin. We can protect ourselves from the sun by wearing a hat, clothes to cover our skin and by using a sun cream with a high UV rating (spf50 or higher) **Sunlight** and UV rays can damage our eyes. We must never look directly at the Sun, even when wearing dark glasses. Wearing sunglasses with a high UV rating can help protect our eyes.	Reflect, bounce, mirror, reflection light source, Sun, Moon, sunset, sunrise, position, ultra-violet rays
Possible misconceptions: We can still see even where there is an absence of any light. Our eyes 'get used to' the dark. The moon and reflective surfaces are light sources. A transparent object is a light source. Shadows contain details of the object, such as facial features on their own shadow. Shadows result from objects giving off darkness.			
Year 4	Children can identify how sounds are made, associating some of them with something vibrating. Children can recognise that vibrations from sounds travel through a medium to the ear. Children can find patterns between the pitch of a sound and features of the object that produced it. Children can find patterns between the volume of a sound and the strength of the vibrations that produced it. Children can recognise that sounds get fainter as the distance from the sound source increases.	**Sound** is a form of **energy**. Sounds are made when objects **vibrate**. The object that makes the sound is called the **source.** The **vibration** makes the air around the object **vibrate** and the air **vibrations** enter your ear. These are called **sound waves**. If an object is making a sound, a part of it is vibrating, even if you cannot see the vibrations. The strength of these **vibrations** affect how loud or quiet a sound is. We call this **volume**. The distance that these **vibrations** travel affects their volume Vibrations travel in waves. These can only travel through solids, liquids and gases. The **energy** is **transferred** through the substance in a **wave.** **Sound waves** travel through a **medium**. When objects vibrate very quickly they produce a higher sound. When vibrations are slower, they produce a lower sound. We call this **pitch**. **Decibels** measure how loud a sound is.	bang, blow, shake, and pluck **Loudness** – volume, quiet, quieter, quietest, loud, louder and loudest **Pitch** - low, lower, lowest, high, higher, and highest Ear, Vibrations, source Energy, transfer, medium Sound waves, decibels
Possible misconceptions:			

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Pitch and volume are frequently confused, as both can be described as high or low. Sound is only heard by the listener. Sound only travels in one direction from the source. Sound can't travel through solids and liquids. High sounds are loud and low sounds are quiet.			
Year 5	Children can describe the movement of the Earth, and other planets, relative to the Sun in the solar system. Children can describe the Sun, Earth and Moon as approximately spherical bodies. Children can use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky. Children can describe the movement of the Moon relative to the Earth.	The **Earth** is a **planet.** It travels around the **Sun**, which is a **star**. Other planets travel around the Sun too. They all travel around the Sun in a fixed way. These are called **orbits**. Every **Earth orbit** lasts 365 1/4 days. (Because of the extra quarter day it takes to orbit the Sun, every four years on Earth is a leap year.) **Planets** that are closer to the sun have shorter **orbits,** and **planets** that are further away have longer **orbits**. The solar systems is in a galaxy called the Milky Way. The galaxy is in the universe. The **Sun, Earth** and **Moon** are almost **spheres.** The Earth **rotates.** This is why we have **night** and **day**. Daytime is when half of the Earth is facing the sun. Night time is when half of the Earth faces away from the sun. The Earth rotates **anticlockwise** so the sun appears to **rise** in the **East** and **set** in the **West**. The Earth **rotates** on its **axis** and makes a complete rotation over 24 hours (a day). This makes it appear as the Sun moves through the sky but the **Earth's rotation** causes **day and night.** The Earth is **tilted**. This causes day and night to be longer or shorter depending on where the Earth is on its orbit. This causes **seasons.** Because of the Earth's tilt, the **poles** experience 24 hours of sunlight in the summer, and very few hours of sunlight in the winter. As the Earth rotates, **shadows** that are formed change in size and orientation. A **satellite** orbits a planet. Satellites can be natural or man-made. Earth's only **natural satellite** is called the Moon. The Moon orbits the Earth every 28 days. The Moon looks different depending on where it is on its **orbit**. These are called the **phases of the Moon**.	Day and night seasons Earth, axis, rotate,anticlockwise Star, Sun, Planets, Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune Phases of the Moon - full moon, gibbous moon, half moon, crescent moon, new moon, waxing ,waning Moon's orbit: lunar month Orbit, planets, revolve, sphere
Possible misconceptions: The Earth is flat. The Sun is a planet. The Sun rotates around the Earth. The Sun moves across the sky during the day. The Sun rises in the morning and sets in the evening. The Moon appears only at night. Night is caused by the Moon getting in the way of the Sun or the Sun moving further away from the Earth.			
Year 6	Children can recognise that light appears to travel in straight lines. Children can use the idea that light travels in straight lines to explain that	Light **travels** in **straight lines**. **Reflection** is when light bounces off a surface - this changes the **direction** in which the light travels. We see because light travels in straight lines from a **source** to our eyes, or via reflecting off a surface.	dark, dull, bright, , brighter, duller, darker, brightest, dullest, darkest Opaque, translucent, transparent

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	objects are seen because they give out or reflect light into the eye. Children can explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes. Children can use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.	When light reaches an object, it can be absorbed, or it can pass through the object or it can be reflected. Light can be scattered in all directions. Light colours reflect more light than darker colours. White objects reflect nearly all light. Black reflects very little light. Because light travels in straight lines, when there is an opaque object blocking the light, a shadow is formed. These shadows have the same shape as the objects that cast them.	Shadow, block, absence of light, emit, light sources Reflect – bounce, mirror, reflection, light source sun, sunset, sunrise, position
Possible misconceptions: We see objects because light travels from our eyes to the object.			

Previously taught – Remains Key Vocabulary, Revisit

Links to other Science programmes of study.