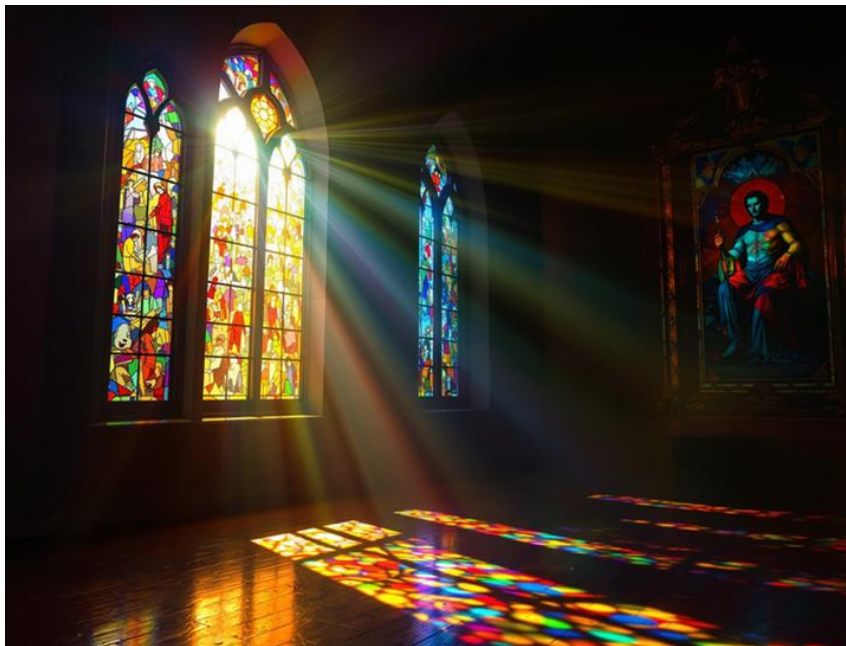


**“Unit 6
The Early Church & the
Byzantine Era
(& Honour & Reverence)”**



Grades
Pre to
Year 6

SCIENCE & TECHNOLOGY

Science & Technology (Grades Prep to Year 6)

“Unit 6 – The Early Church & the Byzantine Era (+ Honour & Reverence)”

SUMMARY:

This Science & Technology course for **Prep to Year 6** is deliberately integrated with the History focus on **the Early Church and the Byzantine era**, with each week’s scientific and technological learning springboarding from the historical themes being studied. Across eight carefully sequenced topics – ranging from matter, food processes, engineering, sound, genetics, brain science, materials, architecture, and ethics – students explore how scientific understanding reveals order in creation and how technology applies that knowledge through human design. Lessons emphasise observation, modelling, testing, and ethical reflection, progressively building a **portfolio-based assessment** that captures scientific understanding, design thinking, and responsible decision-making. Throughout the unit, science is presented not as invention but discovery, and technology as a powerful tool requiring wisdom, humility, and restraint, reinforcing the character focus of **Honour & Reverence** as students learn to use knowledge to build, preserve, and serve rather than harm or dominate

ASSESSMENT PORTFOLIO (BUILT ACROSS 16 LESSONS)

Each lesson contributes one or more artefacts to a student Science & Technology Portfolio, appropriate to age.

Portfolio Components

By the end of the course, each child will have:

1. **Observation Records** (drawings, notes, models)
2. **Design Sketches & Process Plans**
3. **Material Tests & Reflections**
4. **Simple Explanations** (oral / written / visual)
5. **Ethical Reflection Pieces**
6. **Final Integrative Project + Reflection**

Older students (Years 5–6) will show **greater independence, iteration, and justification**.

RESOURCES:

All the information you need is included within the **informational story** in each lesson plan. The hands-on or creative activities are designed to use materials you will likely have already in your home, but you should maintain some **art and craft materials**. Each child will also need a **Science Journal** (i.e., a lined exercise book or Botany

book for nature study notes, writing responses to questions, and writing activities). It is also helpful to have a good **dictionary**.

Two lessons each week, with hands-on activities and extra research will keep the children fully engaged. To enjoy a richer learning experience, you could supplement the lessons with extra books about topics of interest that arise during the course.

Some suggestions for extra reading include but are not limited to...

- to be announced...

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Prior to starting each week, review the recommended resources.

Contents

Topic	Description	Page
Topic 1	Dimensions of Life 1. Science Evidence 2. Four States, Ten Dimensions	
Topic 2	Bread & Wine 1. How Bread is made 2. How wine is made	
Topic 3	Colosseum 1. Colosseum architecture 2. Acoustics of an amphitheatre	
Topic 4	The Technology of Art 1. Edicts on scrolls (Paper-Making) 2. The Science of Pottery	
Topic 5	Order, Patterns & Change in Creation 1. Order, Patterns & Laws of Nature 2. Change versus Stability in the Natural World	
Topic 6	Brain Science 1. Brains made to worship 2. Brain structure & habit formation	
Topic 7	Technology of Cathedrals 1. Cathedral Architecture 2. Making Stained Glass	
Topic 8	Ethics in Science 1. Limitations of Science 2. Ethics: Using Science to build or destroy, to heal or harm.	
Topic 9	Assessment	

TOPIC 1	DIMENSIONS OF LIFE

Introduction Activity:

Parent says: “During this course, as you work on the science lessons each day, you will record your answers to questions and your thoughts about the topics, in your Science Journal.

We will be trying to keep your science journals neat and organised by using headings and subheadings to locate your work. Your Science Journal may be collected for assessment. For each school-term, you will need a separate exercise book to use as your Science Journal for that unit of the course.

So, let’s get out the exercise book you will be using for your Science Journal. The first thing to do to keep it organised is to create your headings and sub-headings.

The Front Cover: On the front cover, you should record the subject title as “SCIENCE JOURNAL”. Then write the name of the unit of study for this first term = “THE EARLY CHURCH up to BYZANTINE ERA”.

Topics: To keep your work organised, so it is easy for your teacher to review, you should place a heading for each Topic in this unit. For example – TOPIC 1..

Lessons: Then, you need to create a subheading for LESSON 1.

Under ‘Lesson 1’ you will then write your responses to questions and activities on the pages for that lesson. The next sub-heading on a new page will be LESSON 2, etc. You will have between 3 and 5 lessons in the week.

Then next week there will be a new heading for TOPIC 2, followed by the lesson numbers in TOPIC 2.

ASSESSMENT: now would be a good time to look over the Assessment Task at section 9 of this Tutor Guide. Record the weekly assessment portfolio tasks & reflections in your Science Journal..

Lesson 1 – Discovering Order: How Science Reveals a Designed World

Theme & Character Focus

Theme: Discovering God's Order in Creation

Character Focus: Honour & Reverence – responding with respect and wonder when we discover how creation works

Learning Objectives

Children will:

- Recognise that science discovers patterns and order in the natural world
 - Understand that many scientific discoveries align with ideas already described in the Bible
 - Practise careful observation and questioning
 - Develop reverence for God as Creator
-

A) Introduction (Vocabulary & Orientation)

Parent says (script):

“Today we are going to talk about how scientists work together to learn about the world – and how many of their discoveries help us better understand what the Bible already tells us about creation.

Science helps us **understand how** the world works.

Technology helps us **apply** that understanding.

Wisdom teaches us **why and when** we should – or should not.”

Pre-teach Vocabulary

- **Science** – studying God's world by observing and testing
- **Discovery** – finding something new that was already there
- **Order** – things working in an organised way
- **Pattern** – something that happens again and again
- **Creation** – everything God made
- **DNA** stands for Deoxyribonucleic Acid. DNA is the molecule inside living cells that carries the instructions for how a living thing grows and works.

Parent action:

Show a leaf, shell, or household object. Ask children to describe any patterns or orderly design that they notice.

B) Informational Story

Parent says:

“I’m going to read you a story about science and discovery. Please listen carefully, because I’ll only read it once. Then I want you to tell me all about it.”

Story: “Finding What Was Already There”

Long ago, people believed the world was messy and random. But as scientists began to observe carefully, they noticed something surprising: the universe follows rules.

Scientists discovered that:

- The stars move in predictable paths
- Living things grow in organised stages
- Matter behaves in reliable ways
- Energy follows fixed laws

These discoveries did not create order – they revealed it.

The Bible had already described this long before microscopes or telescopes existed. It tells us that God created the world with wisdom, order, and purpose. When scientists discover new laws of nature, they are not inventing truth – they are uncovering what God has already put in place.

Science Is Often a Shared Discovery

Because the natural world is complex and orderly, no single person can uncover everything on their own. Science is often collaborative because each scientist builds on what others have already observed, measured, and tested. One person may carefully record data, another may design experiments, and another may explain patterns using mathematics or models. Over time, these shared contributions allow scientific understanding to grow.

For example, one scientist might notice a repeating pattern in nature, another might test it under different conditions, and a third might explain why it works the way it does. Scientific knowledge develops through discussion, correction, and cooperation, with many individuals contributing small but important pieces to a much larger picture. This collaborative process reflects the orderliness of creation itself - knowledge grows step by step, not all at once.

For example:

- Scientists discovered that light behaves in precise ways – the Bible says God created light and also that God *is* light
- Scientists discovered that DNA carries information – the Bible says life was spoken into existence by God’s word
- Scientists discovered the universe had a beginning – the Bible begins with “In the beginning”

Some Bible teachers and scientists, such as Chuck Missler, explained that science often “catches up” to Scripture. He reminded people that science works best when it is humble – when it recognises that the universe is designed, not accidental.

Every new discovery gives us another reason to respond with **honour and reverence** toward the Creator.

C) Narration

Parent says:

“Close your eyes and picture the story like a movie. Now tell me everything you remember.”

(In a family - You could ask the younger child to tell you what they remember; then a middle child may add some more details; then the older child tells as much detail as they can remember. Or you could reverse the order. Begin with oral narrations. In later lessons children may draw or write.

In a classroom, you could break into groups of two or three, and each person has a go at retelling the story.)

D) Teaching Skills (Explicit Instruction)

Parent explains:

- Science looks for **patterns**
- Patterns suggest **order**
- Order suggests **design**
- Discovering order should lead to **respect**, not pride

Key idea for children:

“Science doesn’t replace God – it helps us see His work more clearly.”

E) Thinking Questions (Differentiated)

Foundation–Year 2

- Let’s think about patterns ... What is something in nature that works the same way every day?
- How does that make you feel about God?

Years 3–4

- Why do you think scientists trust patterns?
- What happens if we ignore what we observe?

Years 5 – 6

- Why is humility important when studying science?
 - Can knowledge make us more thankful? Why?
-

F) Practical Activities

Activity 1: Pattern Hunt

- Walk outside or around the home
- Find 3 patterns (leaves, shadows, repetition, movement)
- Record with drawing or words

Activity 2: Observation Journal

- Observe one object for 5 minutes
 - Record colour, shape, behaviour
 - Discuss what this shows about careful study
-

G) Optional Extension Research

- Research one scientific discovery that revealed order (e.g., gravity, DNA)
 - Present findings verbally or visually
-

H) Biblical Connection & Wrap-up

Parent reads: Psalm 19:1

Discuss:

- How does creation “speak”?
- How can we respond with honour and reverence?

Prayer suggestion:

“Thank You, God, for a world that makes sense and shows Your wisdom.”

I) Content Descriptions Addressed

Code	Full Description	Justification
AC9SFH01	Explore the ways people make and use observations and questions to learn about the natural world	Observation and narration
AC9S1H01	Describe how people use science in daily lives	Science as discovery
AC9S3H01	Examine how people use data to develop explanations	Patterns and laws
AC9S5H01	Examine why advances build on previous work	Discoveries reveal prior order
AC9S6H01	Examine why advances result from collaboration	Ongoing scientific discovery

Lesson 2 – Seen and Unseen: Matter, Energy, and God’s Invisible World

Theme & Character Focus

Theme: Seen and Unseen Creation

Character Focus: Honour & Reverence

Learning Objectives

Children will:

- Identify the four states of matter
 - Understand that not everything real is visible
 - Learn that science studies the physical world, while the Bible also reveals the spiritual world
 - Respond with reverence to unseen realities
-

A) Introduction (Vocabulary & Orientation)

Vocabulary: Discuss the meaning of these words...

- **Matter** – anything that takes up space
- **Four States of Matter** = Solid / Liquid / Gas / Plasma
- **Visible / Invisible**
- **Dimension** – a way of describing space
- **Spiritual** – real but not physical

Parent says:

“Today we will learn about things we can see – and things we usually can’t.”

B) Informational Story

Story: “More Than Meets the Eye”

Everything around us is made of matter. Some matter is solid like a rock. Some is liquid like water. Some is gas like air. Scientists also discovered a fourth state called plasma, found in lightning and stars.

Plasma is a state of matter in which gas becomes so energetic that it contains charged particles and can conduct electricity; it is different from blood plasma, which is the liquid part of blood that carries cells and nutrients.

For a long time, people thought only solid things were real. Then they discovered gases. Later, they discovered energy and invisible forces. Today, scientists even use mathematics to describe dimensions we cannot see. Scientists have theorised that there are up to 10 or 11 dimensions, most of which we cannot see.

As scientists studied matter more closely, they discovered that the way matter behaves depends on how tiny particles are arranged inside it. In solids, particles are packed closely together and stay in fixed positions, which is why solids keep their shape. In liquids, particles are still close but can move past one another, allowing liquids to flow and take the shape of their container. In gases, particles are far apart and move freely, which is why gases spread out and can be compressed. Although we cannot see these particles with our eyes, their arrangement explains the visible properties we observe every day.

The Bible has always said that not everything real is visible. Angels, heaven, and God Himself are unseen, yet real. Some Bible teachers have explained that just as air is invisible but real, the spiritual world is real even though we cannot usually see it.

Science studies the physical world. The Bible teaches us about the spiritual world. Both together remind us to be humble and reverent.

C) Narration

Parent prompt:

“Tell me about the different kinds of matter and about the unseen things.”

Additional discussion question (Years 5–6 focus):

“How does the invisible arrangement of particles help explain why solids are hard, liquids flow, and gases spread out?”

D) Teaching Skills (Explicit Instruction)

Parent explains with objects:

- Ice = solid
- Water = liquid
- Steam/air = gas
- Sun/lightning picture = plasma

Key idea:

“Not seeing something does not mean it isn’t real.”

E) Thinking Questions (Differentiated)

F–2

- Can you feel air?
- Is it real?

Years 3–4

- Why did scientists need time to discover plasma?
- What else might exist that we can't see?

Years 5–6

- Why should unseen things make us humble?
 - How does this connect to faith?
-

F) Practical Activities

Activity 1: Matter Stations

- Sort objects into solids and liquids
- Observe air movement
- Watch video of lightning or plasma

Activity 2: Invisible Forces

- Use a magnet near something with iron metal in it.
- Blow bubbles
- Discuss unseen forces

Added Years 5–6 Activity: Particle Models & Properties

- Use small objects (beads, marbles, or rice) to model particles
 - Arrange them tightly in a fixed pattern (solid), loosely but touching (liquid), and far apart (gas)
 - Gently move the models to show how particle movement changes
 - Discuss:
 - Which model keeps its shape?
 - Which one flows?
 - Which one spreads out?
 - Record how particle arrangement explains observable properties
-

G) Optional Extension Research

- Research plasma in stars or lightning
 - Create a labelled diagram
-

H) Biblical Connection & Wrap-up

Parent reads: Colossians 1:16

Discuss:

- Why should we honour God for unseen things?
- How should knowledge affect our attitude?

Prayer focus: Reverence and humility

I) Content Descriptions Addressed

Code	Full Description	Justification
AC9SFU03	Recognise objects are composed of different materials	States of matter
AC9S3U04	Investigate properties of solids and liquids	Matter exploration
AC9S5U04	Explain properties of solids, liquids and gases	Particle models
AC9S6U04	Compare reversible changes including state changes	Matter changes
AC9S3H02	Consider how explanations meet needs	Understanding unseen forces

TOPIC 2	BREAD & WINE

Lesson 2.1 – How Bread Is Made

Theme & Character Focus

Theme: Transformation Through Process

Character Focus: Honour & Reverence – respecting processes that bring nourishment and recognising God’s provision through design and order

Learning Objectives

Children will:

- Understand the basic **science processes** involved in making bread
 - Observe **physical and chemical changes** in materials
 - Learn how people **design and sequence steps** to produce food
 - Recognise that transformation takes **time, order, and care**
 - Respond with honour and gratitude for food and provision
-

A) Introduction (Including Vocabulary to Pre-teach)

Parent/Tutor Says:

“Today we are going to learn how something very ordinary – bread – is made. Even though bread looks simple, it requires careful steps, patience, and the right conditions. This will help us see how science and design work together.”

Pre-teach Vocabulary. Briefly discuss these words so

- **Ingredient** – something used to make food
- **Mixture** – two or more things combined
- **Yeast** – a living organism used in bread-making
- **Fermentation** – a process where yeast changes sugars
- **Dough** – the mixture of grain-flour, water and other ingredients used to make bread
- **Process** – steps done in order
- **Transformation** – a change from one form to another

Parent Action:

Show flour, water, and yeast (or pictures if unavailable). Ask children to predict what might happen when they are mixed.



Image sourced from www.commonswikimedia.org

B) Informational Story

Parent/Tutor Says:

“I’m going to read you a story about how bread is made. Please listen very carefully and picture each step in your mind, because I will only read it once.”

Informational Story: “From Grain to Bread”

Long before bread reaches the table, a journey begins. Wheat grows in fields, using sunlight, water, and soil. Once harvested, the grain is ground into flour. Flour by itself is dry and powdery – it does not look like food yet.

When people make bread, they carefully measure ingredients. Flour is mixed with water, yeast, and sometimes salt. At first, the mixture is sticky and shapeless. But something important is happening.

The yeast, which is a tiny living organism, begins to feed on sugars in the flour. As it does this, it produces gas. The gas becomes trapped in the dough, causing it to rise. This process is called fermentation. Even though we cannot see the yeast working, we can see the results.

The dough must rest. If rushed, it will not rise properly. This shows that some processes cannot be hurried. Time is part of the design.

When the dough is baked in an oven, heat causes another transformation. The dough becomes firm. The gas bubbles expand and then set. The smell changes. The colour changes. The dough becomes bread.

Bread reminds us that transformation often happens in stages, through careful design and patience. People do not invent bread by accident. They observe, test, improve, and follow steps. Science helps us understand what is happening, and technology helps us do it well.

When we eat bread, we are enjoying the result of **order, design, and provision** – gifts that deserve honour and gratitude.

C) Narration

Narration Prompt

Parent/Tutor Says:

“Now close your eyes and picture the story like a movie in your mind. Tell me everything you can remember about how bread is made.”

- Younger children narrate orally
- Older children may retell orally or draw the process or write steps

Portfolio Artefact #1:

Narration – if it is a drawing or written sequence, then include this in your assessment portfolio (you’re your Science Journal)

D) Teaching Skills (Explicit Instruction)

Science Teaching (Parent Explains)

- Mixing flour and water is a **physical change**
- Yeast causes a **chemical change** during fermentation
- Heat causes **irreversible change** when bread bakes
- Not all changes can be undone

Key sentence for children:

“Some changes can be reversed, and some cannot.”

Design & Technology Teaching (Parent Explains)

- Bread-making follows **steps in order**
- Tools and ingredients are chosen for a **purpose**
- People improve recipes by testing and observing
- Good design considers **safety, timing, and outcome**

Key sentence for children:

“Design means planning steps carefully to meet a purpose.”

E) Thinking Questions (Differentiated)

Foundation – Year 2

- What happens when ingredients are mixed?
- Why do you think we wait for dough to rise?

Years 3–4

- Which changes in bread-making can be reversed? ...and which can not be reversed?
- Why is yeast important even though we cannot see it?

Years 5–6

- Why is fermentation both a science process and a design choice?
- What could go wrong if steps are skipped or rushed?

Portfolio Artefact #2:

Recorded answers (oral transcript, drawing, or writing)

F) Practical Activities

Activity 1 – Bread Process Sequencing (All Ages)

Materials:

Printed or drawn cards showing:

1. Gather **ingredients & mix** them
2. **Knead it:** Kneading spreads the carbon dioxide bubbles caused by fermentation evenly throughout the dough, creating a consistent crumb, distributes yeast equally, and evens out the dough's temperature, allowing for uniform proofing and baking of the final product.
3. **Rising:** this gives the yeast extra time to eat sugar and produce gas bubbles
4. **Form it:** to create the shape of your loaf of bread or buns, etc
5. **Baking**

Task: Children place steps in correct order and explain why order matters.

Design Focus: Sequencing steps for a designed solution



Image sourced from www.commonswikimedia.org

Activity 2 – Dough Observation (If baking is possible)

Option A: Real Dough

- Mix flour, water, yeast
- Observe texture changes over time

Option B: Demonstration or Video

- Watch fermentation process
- Record observations

Science Focus: Observing change

Design Focus: Testing materials

Portfolio Artefact #3:

Observation notes or drawings

G) Optional Extension Research Activity

Older Students (Years 5–6):

- Research how different types of bread are made in different cultures or history
- Compare flatbread vs risen bread
- Present findings visually or orally



Image sourced from www.commonswikimedia.org

H) Biblical Connection & Wrap-up

Parent Reads:

“Give us this day our daily bread.” (Matthew 6:11)

Guided Discussion:

- Why does bread represent provision?
- How does understanding the process help us show gratitude?
- How can patience be an act of honour?

Wrap-up Statement (Parent):

“Bread reminds us that good things often take time, care, and respect for the process God designed.”

Prayer (Optional):

A short prayer of thanks for food, provision, and wisdom.

I) Content Descriptions Addressed

Science

Code	Full Description	Justification
AC9SFU03	Recognise that objects can be composed of different materials and describe observable properties	Ingredients and dough
AC9S3U04	Investigate the observable properties of solids and liquids and how adding or removing heat leads to change of state	Baking process
AC9S6U04	Compare reversible and irreversible changes including cooking	Bread baking
AC9S3H02	Consider how people use scientific explanations to meet a need	Food production

Design & Technologies

Code	Full Description	Justification
AC9TDE2K04	Explore how food can be selected and prepared for healthy eating	Bread as food
AC9TDE4P05	Sequence steps to collaboratively make designed solutions	Bread-making steps
AC9TDE6K04	Explain how characteristics of foods influence selection and preparation	Ingredient choices
AC9TDE2P02	Use materials and tools to safely make designed solutions	Practical activity

Lesson 2.2 – How Wine Is Made (Fermentation & Responsibility)

Theme & Character Focus

Theme: Transformation Through Process

Character Focus: Honour & Reverence – understanding powerful processes and treating them with responsibility and restraint

Learning Objectives

Children will:

- Understand the **basic process of fermentation** using grapes
 - Identify **physical and chemical changes** in food production
 - Learn how people **design systems** to control powerful processes
 - Recognise that **knowledge requires responsibility**
 - Develop reverence for boundaries in how science is applied
-

A) Introduction (Including Vocabulary to Pre-teach)

Parent/Tutor Says:

“In the last lesson we learned how bread is made. Today we will learn about another process that also uses fermentation. This lesson is about understanding how the process works – and why wisdom and responsibility are important when people use powerful knowledge.”

Pre-teach Vocabulary

- **Grapes** – fruit used in fermentation
- **Juice** – liquid inside fruit
- **Yeast** – tiny living organism
- **Fermentation** – a process where yeast changes sugar
- **Process** – steps done in order
- **Responsibility** – using knowledge wisely
- **Restraint** – knowing when not to use something

Parent Action:

Show fresh grapes or pictures. Ask children what happens when fruit is crushed.



Image sourced from www.commonswikimedia.org

B) Informational Story

Parent/Tutor Says:

“I’m going to read you a story about how wine is made. Please listen carefully and picture the steps in your mind.”

Informational Story: “From Grapes to Juice – Understanding Fermentation”

Grapes grow on vines, using sunlight, water, and soil. Inside each grape is sweet juice. When grapes are crushed, the juice is released. On the skins of grapes and in the air around us are tiny living organisms called yeast.

When grape juice is left alone, yeast begins to feed on the sugar in the juice. As the yeast works, it changes the sugar into other substances. This process is called fermentation. It is the same kind of process used when bread dough rises, but it produces a different result.

Fermentation is powerful. It changes the liquid in a way that cannot be easily reversed. Because of this, people must carefully control the process. They choose containers, temperatures, and timing to guide what happens.

This shows us something important about science and technology. Understanding a process gives people power – but power must be used wisely. Not everything we *can* do should always be done.

The Bible often speaks about wine as a symbol. Sometimes it represents blessing and celebration. Other times it is used as a warning about excess and loss of self-control. This reminds us that knowledge itself is not good or bad – it is how people use it that matters.

Learning how fermentation works helps us understand chemistry, living organisms, and change. It also teaches us reverence: some processes should be handled carefully, and some should be respected rather than practised.

C) Narration

Narration Prompt

Parent/Tutor Says:

“Close your eyes and picture the grapes, the juice, and the fermentation process. Now tell me everything you remember.”

- Younger children narrate orally
- Older children may retell orally or write or draw a process sequence

Portfolio Artefact #4:

Narration drawing or written explanation of fermentation

D) Teaching Skills (Explicit Instruction)

Science Teaching

Parent Explains:

- Crushing grapes is a **physical change**
- Fermentation is a **chemical change**
- Yeast is a **living organism**
- Some changes are **irreversible**

Key sentence for children:

“Fermentation changes substances in lasting ways.”

Design & Technology Teaching

Parent Explains:

- People design systems to **control fermentation**
- Temperature, time, and containers matter
- Good design includes **limits and safeguards**

Key sentence for children:

“Good design includes knowing when to stop.”

E) Thinking Questions (Differentiated)

Foundation – Year 2

- What happens when grapes are crushed?
- Why do you think fermentation should be controlled?

Years 3–4

- How is fermentation in grapes similar to fermentation in bread?
- Why is this process powerful?

Years 5–6

- Why does increased knowledge increase responsibility?
- How can science be used wisely or unwisely?

Portfolio Artefact #5:

Recorded reflections (oral, written, or visual)

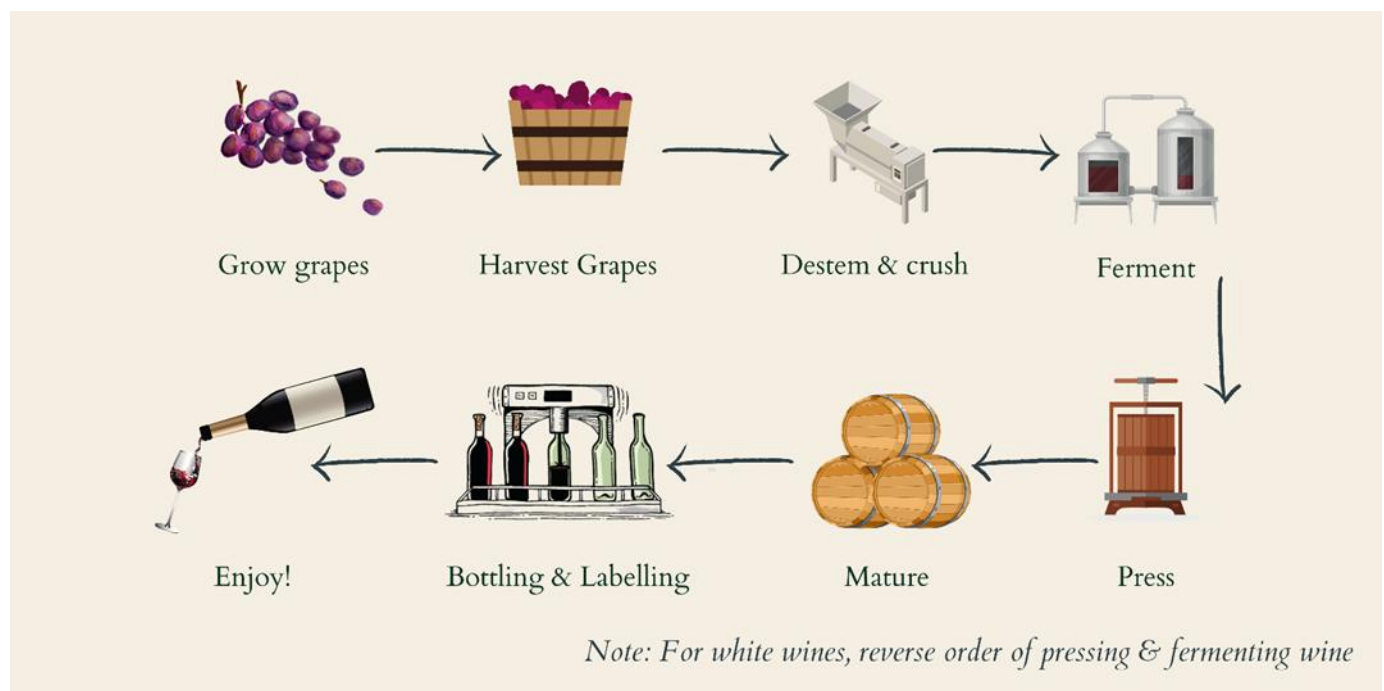


Image sourced from www.commonswikimedia.org

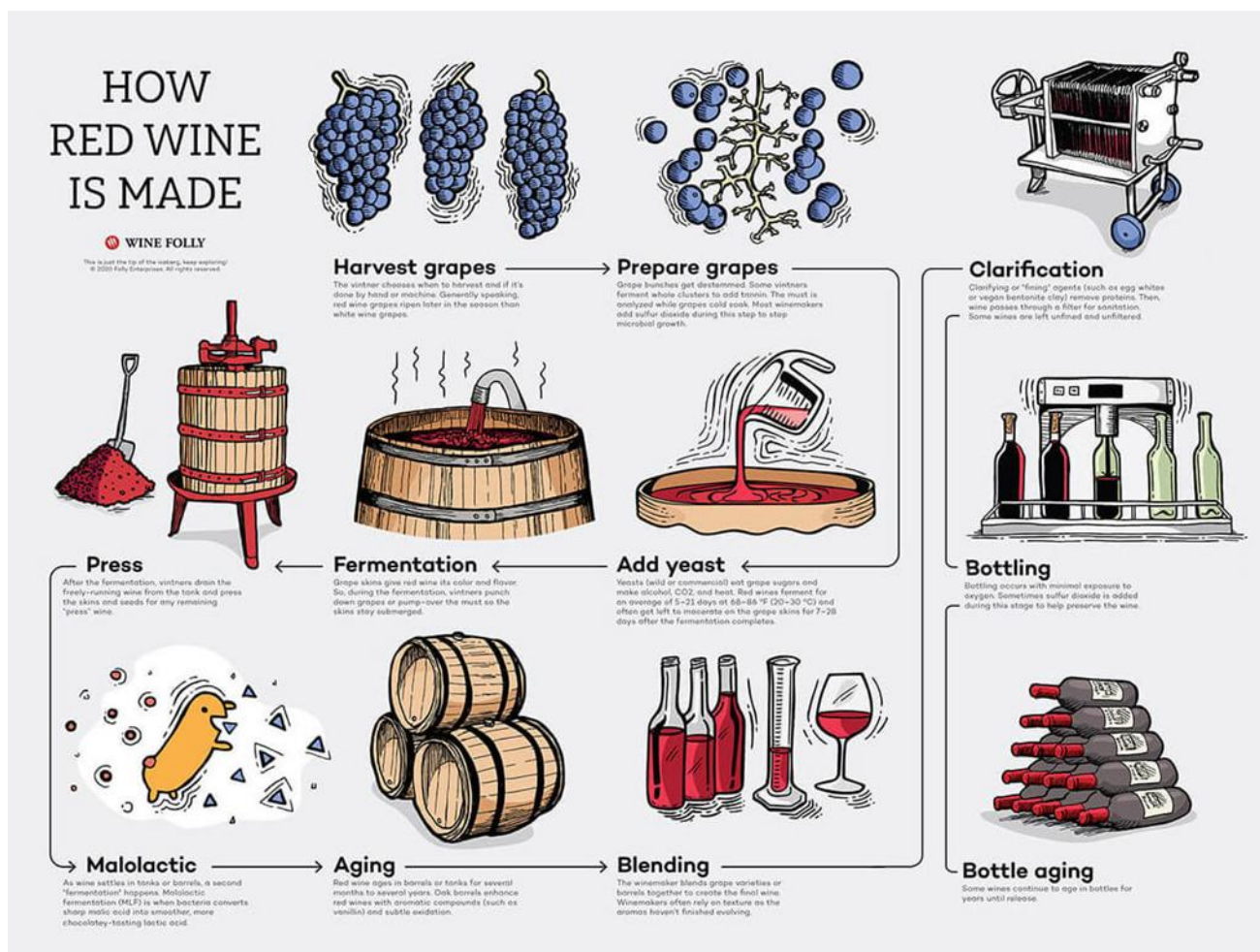


Image sourced from www.commonswikimedia.org

F) Practical Activities

Activity 1 – Comparing Fermentation Processes (All Ages)

Task:

Create a simple comparison chart:

Bread	Grapes
Uses yeast	Uses yeast
Traps gas	Changes liquid
Used for food	Requires restraint

Science Focus: Comparing processes

Design Focus: Analysing systems

Activity 2 – Safe Fermentation Demonstration (No Alcohol)

Option A: Yeast & Sugar in Warm Water

- Observe bubbles forming

- Discuss gas release

Option B: Video or Diagram Study

- Observe controlled fermentation

Safety emphasis:

This activity is **observational**, not consumptive.

Portfolio Artefact #6:

Observation notes or drawings

G) Optional Extension Research Activity

Older Students (Years 5–6):

- Research how fermentation is used safely (bread, yoghurt, cheese)
- Identify when fermentation should be avoided
- Present findings responsibly

H) Biblical Connection & Wrap-up

Parent Reads:

“Wine is a mocker... whoever is led astray by it is not wise.” (Proverbs 20:1)

Guided Discussion:

- Why does the Bible warn about misuse?
- How does understanding science help us make wise choices?
- How can restraint show honour?

Wrap-up Statement (Parent):

“Wisdom is knowing not only how things work, but how they should be used.”

Prayer Focus:

Thankfulness for knowledge, wisdom to use it rightly.

I) Content Descriptions Addressed

Science

Code	Full Description	Justification
AC9S2U03	Recognise materials can be changed physically without changing composition	Grape crushing

Code	Full Description	Justification
AC9S3U04	Investigate properties of solids and liquids and changes	Juice and fermentation
AC9S6U04	Compare reversible and irreversible changes	Fermentation
AC9S3H02	Consider how scientific explanations meet a need	Food processes

Design & Technologies

Code	Full Description	Justification
AC9TDE2K04	Explore how food can be selected and prepared for healthy eating	Responsible food processes
AC9TDE4K03	Describe ways of producing food	Fermentation systems
AC9TDE6K04	Explain how characteristics of foods influence preparation	Sugar content, yeast
AC9TDE4P04	Use design criteria including sustainability to evaluate solutions	Ethical discussion

Lesson 3.1 – Colosseum Architecture: Engineering for Strength and Purpose

Theme & Character Focus

Theme: Strength, Structure, and Purpose

Character Focus: Honour & Reverence – respecting human skill while recognising responsibility in how powerful structures are used

Learning Objectives

Children will:

- Understand how **forces, materials, and shapes** affect building strength
 - Learn how ancient engineers designed large structures to meet specific purposes
 - Explore how **arches and layered structures** distribute force
 - Recognise that technology reflects **human values and intentions**
 - Practise reverence by evaluating **how design is used**, not just how it works
-

A) Introduction (Including Vocabulary to Pre-teach)

Parent/Tutor Says:

“Today we are going to study a famous building from ancient Rome called the Colosseum. It was one of the largest structures of the ancient world and required careful planning, strong materials, and clever design.”

Pre-teach Vocabulary

- **Architecture** – the design of buildings
- **Structure** – how parts are arranged to stay strong
- **Force** – a push or pull
- **Arch** – a curved shape used to support weight
- **Material** – what something is made from
- **Purpose** – the reason something is built

Parent Action:

Show an image of the Colosseum. Ask:
“What do you notice about the shapes and size?”



By Diliff - Own work, CC BY-SA 2.5, <https://commons.wikimedia.org/w/index.php?curid=2127844>

B) Informational Story

Parent/Tutor Says:

“I’m going to read you a story about how the Colosseum was built. Please listen carefully and picture the building step by step.”

Informational Story: “Building the Colosseum”

Nearly two thousand years ago, Roman builders constructed the Colosseum in the city of Rome. It was enormous — large enough to hold tens of thousands of people. Building something so big required more than strength. It required understanding materials, forces, and structure.

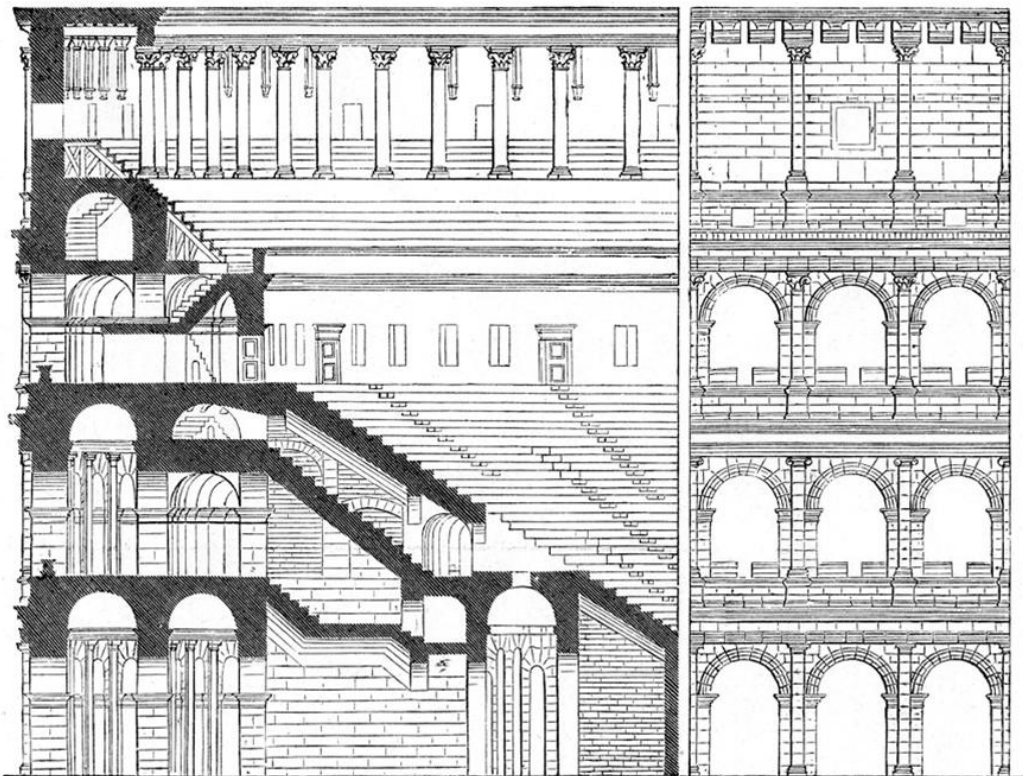
The Colosseum was built using stone, brick, and a special kind of Roman concrete. These materials were chosen because they were strong and long-lasting. But materials alone were not enough. The shape of the building mattered just as much.

One of the most important design features of the Colosseum was the **arch**. An arch spreads the weight above it outward and downward, instead of straight down. This helps prevent collapse. Rows of arches were stacked on top of each other, allowing the building to rise high while remaining stable.



Image sourced from www.commonswiki.org

Inside the Colosseum, corridors and stairways were carefully planned so crowds could move safely. Engineers thought about how people would enter, exit, and sit. This shows that design is not only about strength, but also about **function**.



7. Colosseum. Section and elevation. Begun under Vespasian, finished under Titus 80 A. C.

However, the Colosseum also reminds us that technology itself is neutral. The same engineering skills used to build aqueducts, roads, and bridges were also used to create a place for violent entertainment. This helps us understand an important lesson: **how something is used matters as much as how well it is designed.**

Studying the Colosseum helps us appreciate human creativity and problem-solving, while also reflecting on responsibility and reverence in how knowledge is applied.

C) Narration

Narration Prompt

Parent/Tutor Says:

“Close your eyes and picture the Colosseum. Tell me everything you remember about how it was built and why arches were important.”

- Younger children narrate orally
- Older children may retell orally or write or sketch with labels

Portfolio Artefact #7:

Narration drawing or written explanation of Colosseum structure

D) Teaching Skills (Explicit Instruction)

Science Teaching – Forces & Structures

Parent Explains:

- Gravity pulls weight downward
- Buildings must spread force safely
- Arches redirect force sideways into supports
- Wider bases increase stability

Key sentence for children:

“Good structures spread force instead of fighting it.”

Design & Technology Teaching – Engineering Choices

Parent Explains:

- Builders choose materials based on properties
- Shape affects strength
- Engineers design for both **use and safety**
- Large projects require planning and teamwork

Key sentence for children:

“Design choices affect strength, safety, and purpose.”

E) Thinking Questions (Differentiated)

Foundation – Year 2

- Why do you think round shapes help buildings stay strong?
- What materials do you see in the Colosseum?

Years 3–4

- How does an arch help support weight?
- Why was planning important for such a large building?

Years 5–6

- Why is technology neither good nor bad by itself?
- How should honour and reverence guide design choices?

Portfolio Artefact #8:

Recorded responses or reflections

F) Practical Activities

Activity 1 – Arch Strength Test (All Ages)

Materials:

- Books
- Cardboard or paper strips
- Blocks or cups

Task:

1. Create a flat bridge – test weight
2. Create an arch – test weight
3. Compare results

Science Focus: Forces and load

Design Focus: Testing shapes

Activity 2 – Design a Mini Amphitheatre

Task:

- Sketch a simple seating structure
- Label arches, entrances, and materials
- Explain one design choice

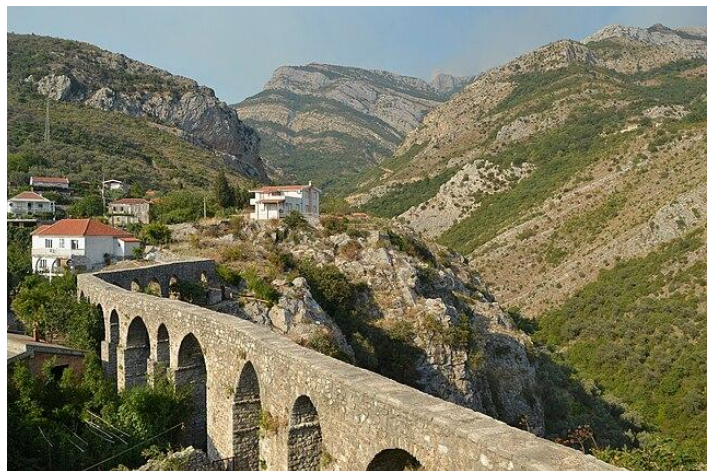
G) Optional Extension Research Activity

Older Students (Years 5–6):

- Research another Roman structure (aqueduct, road, bridge)
- Identify one shared engineering principle
- Present findings visually or orally



This ancient Roman Aqueduct was a structure used to carry water from a very distant water source. Because water cannot flow up-hill, they had to build bridges with the water ditch or pipe on top of it to keep it flowing gently gradually downhill from a mountain lake down to the city.



(Aqueduct images from Wikimedia with [Creative Commons Attribution-Share Alike 4.0](#))



Image sourced from www.commonswikimedia.org

H) Biblical Connection & Wrap-up

Parent Reads:

“Unless the Lord builds the house, the builders labour in vain.” (Psalm 127:1)

Guided Discussion:

- Why is wisdom more important than strength alone?
- How can builders honour God through design?
- How should power be used responsibly?

Wrap-up Statement (Parent):

“True strength includes wisdom, restraint, and reverence.”

Prayer Focus:

Thankfulness for human creativity and guidance in using it wisely.

I) Content Descriptions Addressed

Science

Code	Full Description	Justification
AC9S4U03	Identify how forces can be exerted by one object on another and investigate their effects	Arches and load
AC9S3U02	Compare observable properties of materials	Stone, concrete
AC9S4H02	Consider how scientific explanations meet a need or solve a problem	Engineering solutions

Design & Technologies

Code	Full Description	Justification
AC9TDE4K02	Describe how forces and properties of materials affect function	Arches and materials
AC9TDE4P01	Explore needs or opportunities for designing and test materials	Arch testing
AC9TDE4P02	Generate and communicate design ideas	Amphitheatre sketch
AC9TDE6K05	Explain how properties of materials affect use	Material choice

Lesson 3.2 – Acoustics of an Amphitheatre: Sound, Space, and Design

Theme & Character Focus

Theme: Communication, Sound, and Space

Character Focus: Honour & Reverence – valuing clear communication and recognising responsibility in how spaces amplify voices and messages

Learning Objectives

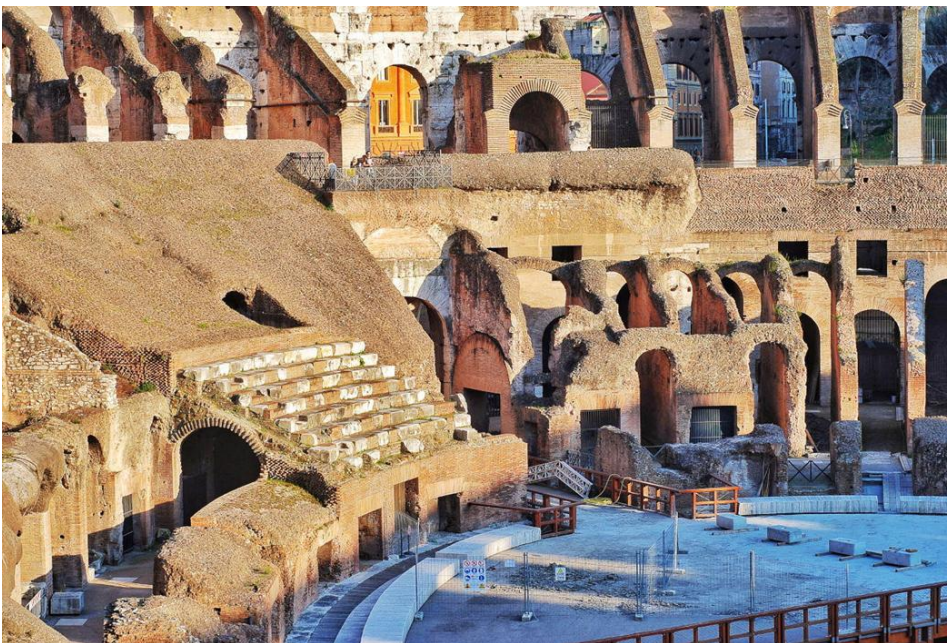
Children will:

- Understand how **sound is produced and travels** through vibration
 - Explore how **shape and materials** affect sound reflection and clarity
 - Learn how ancient builders **designed spaces** to project sound without technology
 - Compare **natural acoustics** with modern amplification
 - Reflect on how amplified voices can be used **wisely or unwisely**
-

A) Introduction (Including Vocabulary to Pre-teach)

Parent/Tutor Says:

“In the last lesson we learned how the Colosseum was built to be strong. Today we will learn how it was also designed so people could **hear** what was happening inside. Sound can be shaped by space.”



https://colosseumrometickets.com/seating-colosseum/?utm_source=chatgpt.com

Pre-teach Vocabulary

- **Sound** – energy made by vibration
- **Vibration** – fast back-and-forth movement
- **Echo** – sound reflected back
- **Acoustics** – how sound behaves in a space
- **Reflection** – sound bouncing off surfaces
- **Absorption** – sound being soaked up by materials

Parent Action: Clap once in a large room, then in a small room. Ask children what changes.

B) Informational Story

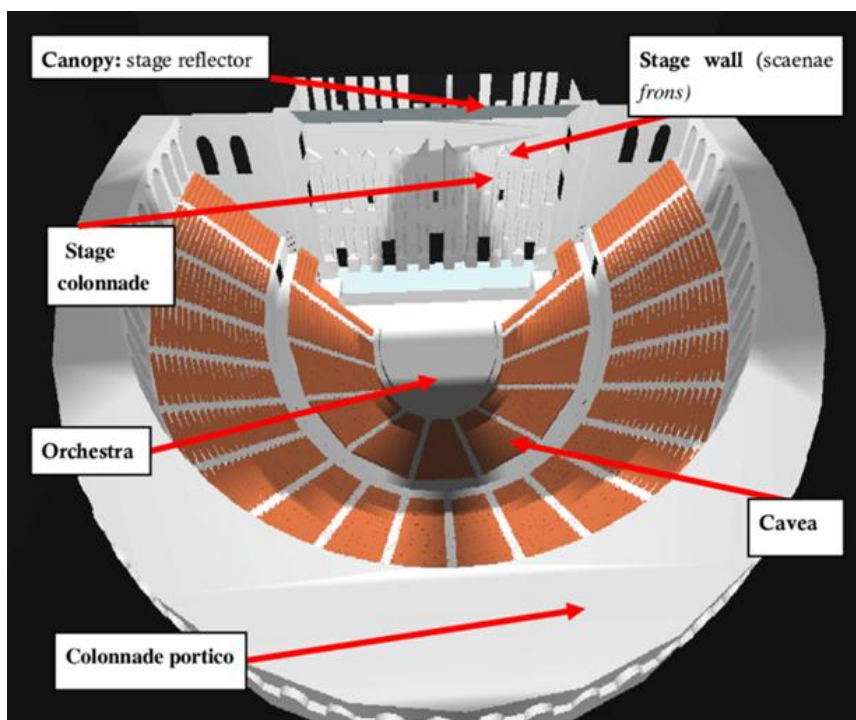
Parent/Tutor Says: “I’m going to read you a story about sound and amphitheatres. Please listen carefully and imagine the sound moving through space.”

Informational Story: “When Buildings Carry Voices”

Sound begins with movement. When a person speaks, the vocal cords in their throat vibrate. These vibrations travel through the air as sound waves. If nothing blocks them, the waves keep moving until they lose energy.

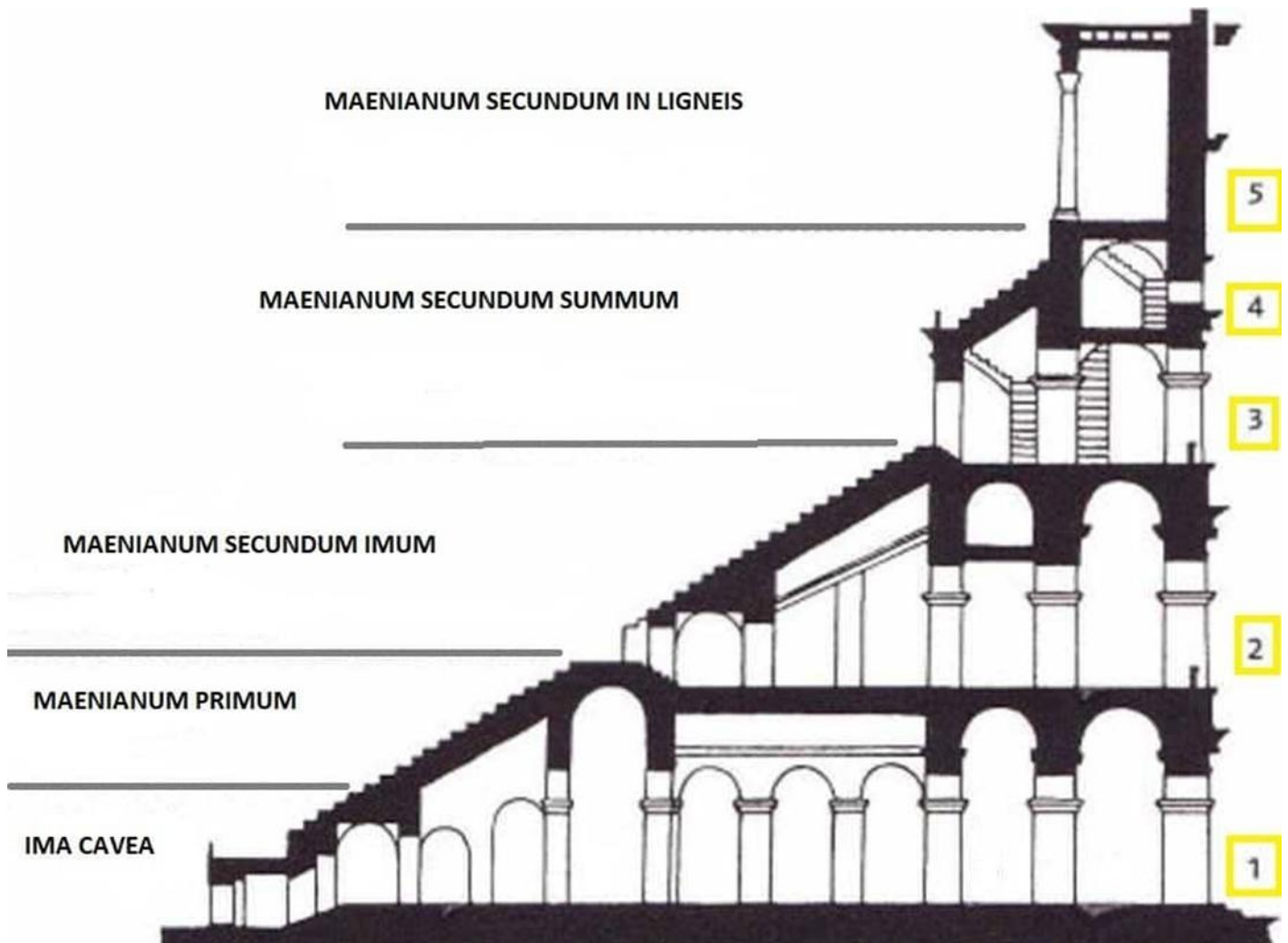
Ancient Roman builders did not have microphones or speakers. Yet in large amphitheatres, people could hear voices and music clearly. This was possible because the **shape** of the building helped guide sound.

The Colosseum and other amphitheatres were built in a wide, curved bowl. When sound was made near the centre, the curved walls and seating reflected sound waves upward and outward. Instead of spreading randomly, the sound was directed toward the audience.



https://www.researchgate.net/figure/The-main-architectural-and-acoustical-elements-of-a-typical-open-air-Roman-theatre_fig1_268364356?utm_source=chatgpt.com

Materials mattered too. Stone reflected sound better than soft materials. Open spaces prevented sound from becoming trapped or muddled. The height and spacing of seats helped prevent echoes from overlapping.



https://colosseumrometickets.com/seating-colosseum/?utm_source=chatgpt.com

These design choices show careful observation. Builders noticed how sound behaved and shaped their buildings accordingly. They used science – even before it was written down – to solve a communication problem.

Sound design reminds us that voices can be strengthened by technology and space. This is powerful. A loud voice can teach, warn, encourage – or mislead. Because sound can reach many people at once, it must be used with care and reverence.

C) Narration

Parent/Tutor Says:

“Close your eyes and picture sound waves moving through the amphitheatre. Tell me what helped people hear clearly.”

- Younger children narrate orally

- Older children may retell orally or draw sound paths or write a short explanation

Portfolio Artefact #10:

Narration drawing or written explanation of sound travel

D) Teaching Skills (Explicit Instruction)

Science Teaching – Sound Energy

Parent Explains:

- Sound is caused by **vibrations**
- Sound travels through air as waves
- Hard surfaces reflect sound
- Soft surfaces absorb sound

Key sentence for children:

“Sound travels best when it is guided, not blocked.”

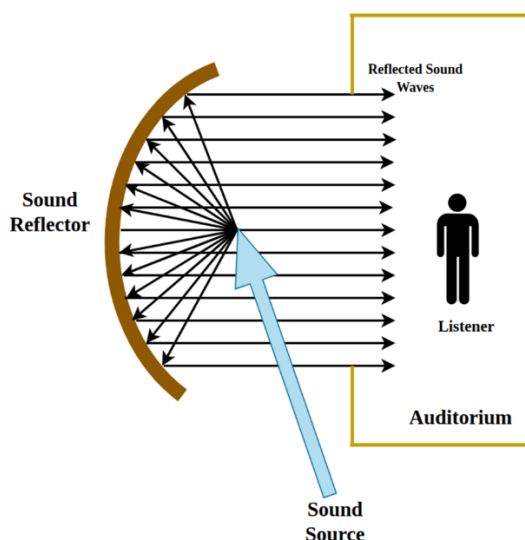
Design & Technology Teaching – Designing for Communication

Parent Explains:

- Builders shape spaces to control sound
- Design choices affect clarity
- Good acoustic design considers **audience, distance, and purpose**
- Engineers test and improve designs

Key sentence for children:

“Design helps sound reach people clearly and safely.”



E) Thinking Questions (Differentiated)

Foundation – Year 2

- What makes sound?
- Why does sound bounce off walls?

Years 3–4

- How does a curved wall help sound travel?
- Why is stone better than fabric for sound reflection?

Years 5–6

- Why is sound design powerful?
- How should honour and reverence guide the use of amplified voices?

Portfolio Artefact #11:

Recorded responses or reflections

F) Practical Activities

Activity 1 – Echo & Reflection Test (All Ages)

Materials:

- Paper cups
- Cardboard curves
- Open space

Task:

1. Speak toward a flat surface
2. Speak toward a curved surface
3. Compare clarity and loudness

Science Focus: Sound reflection

Design Focus: Testing shape effects

Activity 2 – Design a Listening Space

Task:

- Draw a small theatre or meeting space
- Decide where people sit and where sound starts
- Explain one design choice that helps hearing

G) Optional Extension Research Activity

Older Students (Years 5–6):

- Research modern theatres or concert halls
 - Compare ancient and modern sound design
 - Identify one shared principle
-

H) Biblical Connection & Wrap-up

Parent Reads:

“Faith comes by hearing.” (Romans 10:17)

Guided Discussion:

- Why is hearing important?
- How can sound be used to build others up?
- How does reverence affect how we speak and listen?

Wrap-up Statement (Parent):

“Because voices carry power, they must be guided by wisdom, and not used in anger. Our voices should be used to build others up, not tear them down.”

Prayer Focus:

Thankfulness for communication and discernment in listening.

I) Content Descriptions Addressed

Science

Code	Full Description	Justification
AC9S2U02	Explore how sound energy causes objects to vibrate	Sound production
AC9S3U03	Identify sources of heat or sound energy and examine transfer	Sound waves
AC9S4U03	Identify how forces affect motion	Vibration and wave movement
AC9S3H02	Consider how scientific explanations meet a need	Communication design

Design & Technologies

Code	Full Description	Justification
AC9TDE4K02	Describe how forces and properties of materials affect function	Sound reflection
AC9TDE4P01	Explore needs and test materials and processes	Echo experiments
AC9TDE4P02	Generate and communicate design ideas	Listening-space design
AC9TDE6K05	Explain how properties affect use	Stone vs soft materials

Lesson 4.1 – Edicts on Scrolls: Paper Making, Communication, and Responsibility

Theme & Character Focus

Theme: Communication Through Materials

Character Focus: Honour & Reverence – respecting the power of written words and the materials used to preserve and spread them

Learning Objectives

Children will:

- Understand how **paper and scrolls** were made in the past
- Explore the **material properties** that make paper useful
- Learn how technology supports **communication and authority**
- Investigate how people **designed processes** to record information
- Reflect on why written words require **care, honesty, and reverence**

A) Introduction (Including Vocabulary to Pre-teach)

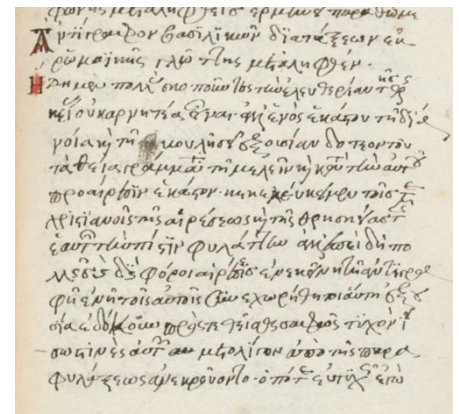
Parent/Tutor Says:

“In History, we’ve been learning about Emperor Constantine and the “Edict of Milan” which legalised Christianity. An ‘edict’ is an official order or proclamation issued by a person in authority: In ancient times words were written on a scroll (like a rolled up piece of paper) made of either cloth, animal skin, or plant fibre (papyrus).

Today we are going to learn about how people recorded important messages before books and printers.”

Pre-teach Vocabulary

- **Scroll** – a rolled document for writing
- **Edict** – an official message or command
- **Manuscript** – a handwritten text



https://commons.wikimedia.org/wiki/Category:Edict_of_Milan

- **Paper** – a material made from fibres
- **Fibre** – thin strands used to make materials
- **Record** – to store information for later

Parent Action:

Show a piece of paper and gently tear it. Ask why paper is useful for writing but still fragile.



B) Informational Story

Parent/Tutor Says:

“I’m going to read you a story about how people made paper and scrolls to record important messages. Please listen carefully and picture the process.”

Informational Story: “When Words Needed a Home”

Before computers, printers, or notebooks, people still needed to record laws, stories, and instructions. Important messages, called edicts, had to be written in a way that could last and be shared.

Early writers used stone, clay tablets, animal skins, and plant fibres. Over time, people learned that fibres from plants could be soaked, crushed, and pressed into thin sheets. When dried, these sheets became paper.

Paper worked because fibres overlap and tangle together. When wet, fibres can move and rearrange. When dry, they lock into place. This makes paper light, flexible, and strong enough to hold ink.

Scrolls were made by joining sheets together and rolling them. This protected the writing and made long texts easier to carry. The design of a scroll shows careful thinking about storage, reading, and durability.

The invention of paper changed history. Messages could travel further than they could if written on clay tablets. Laws could be copied. Knowledge could be preserved. But this also meant words had power. Written words could guide people – or mislead them.



<https://helenhiebertstudio.com/drying-techniques>

Technology does not decide what is written. People do; and your words can get you into trouble. This is why we have to be very careful about not only the words that we speak, but also careful about any words that we write.

C) Narration

Narration Prompt

Parent/Tutor Says:

“Close your eyes and picture fibres becoming paper and paper becoming a scroll. Tell me everything you remember.”

- Younger children narrate orally
- Older children may write or draw the process

Portfolio Artefact #25:

Narration drawing or written explanation of paper-making

D) Teaching Skills (Explicit Instruction)

Science Teaching – Material Properties

Parent Explains:

- Paper is made from fibres
- Wet fibres move; dry fibres lock together
- Paper is flexible but tearable
- Materials are chosen for their properties

Key sentence for children:

“Materials behave differently based on their structure.”

Design & Technology Teaching – Designing for Communication

Parent Explains:

- People design materials to store information
- Scrolls are designed for protection and transport
- Design includes **purpose, durability, and usability**
- Technology supports communication but requires responsibility

Key sentence for children:

“Good design helps messages last and travel.”

E) Thinking Questions (Differentiated)

Foundation – Year 2

- Why is paper good for writing?
- What happens if paper gets wet?

Years 3–4

- Why were scrolls rolled instead of folded?
- How did paper change communication?

Years 5–6

- Why does writing increase responsibility?
- How should honour and reverence guide what we record?

Portfolio Artefact #13:

Recorded responses or discussion notes

F) Practical Activities

Activity 1 – Make Simple Paper (All Ages)

Materials (adapt as needed):

- Scrap paper
- Water
- Blender or tearing by hand
- Sieve or mesh
- Cloth or paper towel

Task:

1. Soak paper scraps
2. Break into pulp
3. Spread pulp on mesh
4. Press and dry

Science Focus: Fibre behaviour

Design Focus: Process design

Activity 2 – Create a Mini Scroll

Task:

- Write a short message or proverb
- Roll paper and tie with string

- Discuss why scrolls protect writing

Portfolio Artefact #14:

Handmade paper or scroll sample

G) Optional Extension Research Activity

Older Students (Years 5–6):

- Research papyrus, parchment, or early Chinese paper
- Compare materials and durability
- Explain why paper became widespread

H) Biblical Connection & Wrap-up

Parent Reads:

“Write the vision; make it plain.” (Habakkuk 2:2)

Guided Discussion:

- Why does writing matter?
- How can written words be used for good or harm?
- Why should we treat recorded knowledge carefully?

Wrap-up Statement (Parent):

“Words written down carry responsibility.”

Prayer Focus:

Wisdom and honesty in communication.

I) Content Descriptions Addressed

Science

Code	Full Description	Justification
AC9SFU03	Recognise objects are composed of different materials	Paper fibres
AC9S3U02	Compare observable properties of materials	Wet vs dry paper
AC9S4U04	Examine properties of natural and made materials	Paper as made material

Code	Full Description	Justification
AC9S3H02	Consider how explanations meet needs	Communication

Design & Technologies

Code	Full Description	Justification
AC9TDE2K01	Identify how products are designed to meet needs	Scrolls
AC9TDE4K01	Examine design factors affecting products	Writing materials
AC9TDE4P03	Select and use materials safely	Paper making
AC9TDE6K05	Explain how properties affect use	Fibre behaviour

Lesson 4.2 – The Science of Pottery: Clay, Fire, and Permanent Change

Theme & Character Focus

Theme: Transformation Through Heat and Skill

Character Focus: Honour & Reverence – respecting processes that cause permanent change and recognising responsibility in shaping lasting objects

Learning Objectives

Children will:

- Understand how **clay changes** through water, shaping, and heat
 - Identify **reversible and irreversible changes** in materials
 - Explore how people designed pottery for **daily life and culture**
 - Learn why **heat** is a powerful scientific tool
 - Reflect on why permanent changes require care and wisdom
-

A) Introduction (Including Vocabulary to Pre-teach)

Parent/Tutor Says:

“In our last lesson we learned how paper is made and how it can be changed again by water. Today we will learn about a material that, once fired, cannot be changed back.”

Pre-teach Vocabulary

- **Clay** – natural material from the earth
- **Pottery** – objects made from shaped clay
- **Kiln** – a very hot oven for firing clay
- **Fire** – heat energy
- **Reversible change** – a change that can be undone
- **Irreversible change** – a change that cannot be undone

Parent Action:

Show modelling clay or air-dry clay. Ask what happens if it gets wet.

B) Informational Story

Parent/Tutor Says:

“I’m going to read you a story about how clay becomes pottery. Please listen carefully and imagine the changes step by step.”

Informational Story: “From Earth to Vessel”

Have you ever seen a ‘potter’ making pottery bowls or vases, plates or cups, etc?



<https://thepotterywheel.com/potters-wheel-history>

He makes these things out of clay. Clay is found in the ground and forms when rocks break down over time. When dry, clay is hard and crumbly. When water is added, clay becomes soft and mouldable. This makes it easy to shape into bowls, cups, and jars.

At this stage, clay can still be changed. If the shape is not right, water can be added and the clay reshaped. This is a reversible change.

But when clay is placed in a kiln and heated to very high temperatures, something new happens. The heat removes all remaining water and causes tiny particles in the clay to lock together. The clay becomes hard, strong, and waterproof. This is called firing.



<https://www.thesprucecrafts.com/an-overview-of-the-firing-process>

Firing is an irreversible change. Once clay is fired, it can no longer be turned back into soft clay. This makes pottery durable and long-lasting. Archaeologists often find pottery pieces that are thousands of years old.

People have used pottery to store food, carry water, and record history through decoration. The science of pottery shows how heat, time, and skill work together to create lasting tools. Because the change is permanent, potters must work carefully and thoughtfully.

Pottery reminds us that some choices shape things forever. Understanding science helps us act carefully with honour and reverence when making lasting changes.

C) Narration

Narration Prompt

Parent/Tutor Says:

“Close your eyes and picture clay being shaped and then fired. Tell me everything you remember about how clay changes.”

- Younger children narrate orally
- Older children may orally retell or write or draw the stages

Portfolio Artefact #15:

Narration explanation (drawing or written)

D) Teaching Skills (Explicit Instruction)

Science Teaching – Changes of State and Heat

Parent Explains:

- Clay changes when water is added
- Heat causes particles to bond permanently
- Some changes cannot be reversed
- Heat is a powerful form of energy

Key sentence for children:

“Heat can cause permanent change.”

Design & Technology Teaching – Designing Durable Objects

Parent Explains:

- Pottery is designed for strength and usefulness
- Shape affects function
- Designers must plan before firing
- Mistakes cannot be undone after firing

Key sentence for children:

“Good design requires planning before permanent change.”

E) Thinking Questions (Differentiated)

Foundation – Year 2

- What happens when clay gets wet?
- What happens when clay is fired?

Years 3–4

- Why is firing an irreversible change?
- Why is pottery useful for everyday life?

Years 5–6

- Why does permanent change require responsibility?
- How should honour and reverence guide the use of powerful tools?

Portfolio Artefact #16:

Recorded responses or reflections

F) Practical Activities

Activity 1 – Clay Shaping (All Ages)

Materials:

- Modelling clay or air-dry clay

Task:

- Shape a small bowl or cup
- Discuss how shape affects use

Science Focus: Material properties

Design Focus: Form and function

Activity 2 – Reversible vs Irreversible Sorting

Task:

- Sort changes into two groups:
 - Making objects with playdough
 - Melting ice

- Baking bread
- Firing pottery
- Tearing paper
-

Portfolio Artefact #17:
Sorting chart or explanation

G) Optional Extension Research Activity

Older Students (Years 5–6):

- Research ancient pottery styles
- Identify how decoration showed culture or purpose
- Explain why pottery lasts so long

H) Biblical Connection & Wrap-up

Parent Reads:

“The potter has power over the clay.” (Romans 9:21)

Guided Discussion:

- Why is clay often used as a metaphor?
- How does understanding pottery help explain this verse?
- Why does permanence invite reverence?

Wrap-up Statement (Parent):

“Some changes shape things for a long time.”

Prayer Focus:

Wisdom and care in choices that have lasting effects.

I) Content Descriptions Addressed

Science

Code	Full Description	Justification
AC9S2U03	Recognise materials can be changed physically	Wet clay
AC9S6U04	Compare reversible and irreversible changes	Firing pottery
AC9S3U02	Compare properties of materials	Clay stages
AC9S3H02	Consider how explanations meet needs	Durable vessels

Design & Technologies

Code	Full Description	Justification
AC9TDE4K02	Describe how properties of materials affect function	Fired clay
AC9TDE4P03	Select and use materials safely	Clay shaping
AC9TDE6K05	Explain how properties affect use	Durability
AC9TDE4P04	Evaluate solutions based on criteria	Pottery usefulness

TOPIC 5

ORDER, PATTERNS & CHANGE IN CREATION

LESSON 5.1 – Order, Patterns & Laws of Nature

Theme & Character Focus

Theme: Order and Faithfulness in Creation

Character Focus: Honour & Reverence – responding with respect when we observe consistency, reliability, and order in the natural world

Learning Objectives

Children will:

- Recognise that the natural world follows observable patterns
- Identify repeating patterns in time, movement, and growth
- Understand that scientific “laws” describe consistent behaviour in nature
- Distinguish between *discovering* patterns and *creating* them
- Respond with reverence to the reliability and order seen in creation

A) Introduction (Vocabulary & Orientation)

Parent/Tutor Says:

“Today we are going to look carefully at the world around us and notice something important.”

“Many things in creation follow patterns. They happen in an ordered way, again and again.”

“Scientists do not invent these patterns – they discover them.”

Pre-teach Vocabulary

- **Pattern** – something that repeats in a predictable way
- **Order** – things arranged or working in a reliable way
- **Law (of nature)** – a rule that describes how something always behaves
- **Observe** – to watch carefully
- **Predict** – to guess what will happen next based on patterns

Parent Action:

Ask children:

- “What happens every morning?”
- “What happens every night?”

- “What comes after winter?”

B) Informational Story (Read Once Aloud)

Parent/Tutor Says:

“I’m going to read you a story about patterns in the world. Please listen carefully, because I will only read it once.”

Story: “A World That Keeps Its Word”

Every morning, the sun rises. Every evening, it sets. Long before clocks or calendars existed, people noticed this pattern. Days followed nights. Seasons followed seasons. The world behaved in a reliable way.

As people watched carefully, they began to notice more patterns. The moon changed shape in a regular cycle. Ocean tides moved in and out each day. Seeds grew into the same kinds of plants each time they were planted.

Just as the sun, moon, and seasons follow dependable patterns, living things are also designed with forms and behaviours that help them survive. Birds have hollow bones and wings shaped for flight, allowing them to move efficiently and escape danger. Fish have streamlined bodies and fins that help them glide through water, while plants have roots that anchor them and draw up water and nutrients from the soil. Many animals behave in patterned ways – migrating at certain times of year, building shelters, or caring for their young – because these behaviours increase their chances of survival. The shape of a creature’s body and the way it acts are not random; they work together in purposeful ways that help living things stay alive in the environments God designed them to live in.

These patterns were not accidents. They did not change based on feelings, opinions, or rulers. They continued whether people paid attention or not.

Scientists later gave names to these patterns. They called them “laws of nature.” A law of nature does not force something to behave – it describes how it already behaves. Gravity does not decide to work; it always works. Objects fall every time they are dropped.

What would happen if there was no gravity?.....

It might be nice to fly; but without gravity acting like an anchor, you would just kept on going and wouldn’t be able to get home again?

Because the world is ordered, people can plan. Farmers know when to plant. Builders know how structures will behave. Sailors know how tides move. Scientists can test ideas because the world responds consistently.



<https://lumiere-a.akamaihd.net/>

Order in nature helps us trust what we observe. It allows learning to build over time. When the world behaves reliably, knowledge can grow.

We can thank God for some things that are always the same, that are reliable. A world that keeps its patterns is a world that can be studied, cared for, and respected.

C) Narration

Narration Prompt:

“Close your eyes and picture the patterns described in the story. Tell me everything you remember.”

Differentiation

- **F–2:** Oral narration (adult records keywords)
- **Years 3–4:** Oral or written list of patterns
- **Years 5–6:** Written narration explaining why patterns matter

Discussion Question

If the shapes of animals, the parts of plants, and the behaviours of living things help them survive in specific environments, what does this suggest about whether the natural world is random or carefully designed? What examples of order can you see in living things around you?

Portfolio Artefact #18:

Narration record (drawing, list, or written explanation)

D) Teaching Skills (Explicit Instruction)

Science Teaching

- Patterns help us understand how the world works
- Laws describe what always happens
- Consistency allows testing and learning
- Observation comes before explanation

Key Sentence for Children:

“The world behaves in reliable ways.”

Design & Technology Teaching

- Designs work best when they follow natural laws
- Engineers must respect patterns and limits
- Good design works *with* order, not against it

Key Sentence for Children:

“Good design follows how the world already works.”

E) Thinking Questions (Differentiated)

Foundation – Year 2

- What is something that happens every day?
- Does the sun ever forget to rise?

- How does the daily changes with the sun affect everyday life?
- How do seasonal changes in the environment (Summer, Winter, Autumn & Spring, plus wet & dry seasons) affect everyday life?
- How do people use the science of seasonal patterns to make predictions that can help them in daily life?

Years 3–4

- Why are patterns helpful?
- What would happen if patterns changed randomly?
- Imagine you are a scientist trying to understand the patterns and relationships that you see in nature. Think of one area you would like to understand (eg., in animals, or how plants grow, or the weather & seasons, or the earth, sky or planets.) What is **one question** that you would like to research or do experiments (or more observations) to understand the patterns you see in nature?
- When a scientist poses a question, they often **make a prediction (or a guess)** about what might be the answer based on their observations. Can you think of a possible answer to your question?

Years 5–6

- How does the form and behaviour of living things enable survival?
- Why can science exist only in an ordered world?
- How does reliability invite reverence?

F) Practical Activities

Activity 1 – Pattern Hunt (All Ages)

Children find:

- A time pattern
- A movement pattern
- A growth or shape pattern

Record with drawings or words.

Activity 2 – Predict the Next Step

Show sequences (days, seasons, shapes).

Children predict what comes next and explain why.

Extra Activity for Y

Portfolio Artefact #19:

Pattern record or prediction sheet

G) Optional Extension (Years 5–6)

Research one natural pattern (day/night, tides, seasons).

Explain how people depend on it.

H) Biblical Connection & Wrap-Up

Parent Reads: “*God is not a God of confusion, but of peace.*” (1 Corinthians 14:33)

Wrap-Up Statement:

“When we study patterns, we are learning how creation stays faithful.”

Australian Curriculum v9 – Science (F–6)

Code	Full Description	Justification (Specific to This Lesson)
AC9SFH01	Explore the ways people make and use observations and questions to learn about the natural world	Children observe daily, seasonal, and biological patterns and are explicitly taught that observation comes before explanation.
AC9SF101	Pose questions and make predictions based on experiences	Children predict what comes next in sequences (day/night, seasons, growth patterns) using observed regularity.
AC9SF103	Represent observations in provided templates and identify patterns with guidance	Pattern hunts, narration drawings, lists, and prediction records explicitly require identifying and recording patterns.
AC9S1U02	Describe daily and seasonal changes in the environment and explore how these changes affect everyday life	The lesson directly references day/night cycles, seasons, planting, sailing, and planning based on reliable environmental patterns.
AC9S1H01	Describe how people use science in their daily lives, including using patterns to make scientific predictions	Examples include farming, building, sailing, and planning based on consistent natural behaviour.
AC9S2U01	Recognise Earth is a planet in the solar system and identify patterns in the changing position of the sun, moon, planets and stars in the sky	Sun rising/setting and moon cycles are explicitly discussed as observable repeating patterns.
AC9S2H01	Describe how people use science in their daily lives, including using patterns to make scientific predictions	Reinforced through multiple real-world dependency examples (tides, seasons, gravity, growth).
AC9S3I01	Pose questions to explore observed patterns and relationships and make predictions based on observations	Higher-order questions ask why patterns matter and what would happen if they changed randomly. Then in the ‘Thinking Questions’ section, students pose their own question for an experiment, and make a possible guess (prediction) of an answer.
AC9S3H01	Examine how people use data to develop scientific explanations	The explanation of “laws of nature” as named descriptions of observed patterns directly addresses this.
AC9S3H02	Consider how people use scientific explanations to meet a need or solve a problem	Predictability enabling farming, building, navigation, and testing ideas is explicitly stated.
AC9S5U01	Examine how particular structural features and behaviours of living things enable their survival in specific habitats	The lesson explicitly explains animal body structures, plant roots, migration, and behavioural patterns linked to survival.
AC9S6U02	Describe the movement of Earth and other planets relative to the sun and model how Earth’s tilt, rotation and revolution relate to cyclic observable phenomena	Upper-primary extension discussion of day/night and seasonal cycles is consistent with this descriptor.
AC9S6H02	Investigate how scientific knowledge is used by individuals and communities to identify problems, consider responses and make decisions	The lesson explicitly argues that ordered reality enables science, planning, trust, and long-term decision-making.

LESSON 5.2 – Change vs Stability in the Natural World

Theme & Character Focus

Theme: Stability beneath Change

Character Focus: Honour & Reverence – recognising what changes and what remains constant

Learning Objectives

Children will:

- Identify changes that happen in nature
 - Recognise stable systems beneath visible change
 - Distinguish surface change from structural stability
 - Understand that change does not mean chaos
 - Respond with reverence to dependable order during change
-

A) Introduction (Vocabulary & Orientation)

Parent/Tutor Says:

“The world changes – but not everything changes in the same way.”

“Today we will look at what changes, and what stays steady underneath.”

Vocabulary

- **Change** – becoming different
 - **Stability** – staying steady
 - **Cycle** – changes that repeat
 - **Structure** – how something is organised
 - **Foundation** – what supports something
-

B) Informational Story (Read Once Aloud)

Story: “What Moves and What Holds”

Leaves fall from trees each year. Yet the tree remains. Rivers flow constantly, yet the riverbanks stay in place. Clouds change shape, but the sky remains.

Nature shows us that change does not mean disorder. Many changes happen within stable systems. Seasons change, but the order of seasons does not. Day changes to night, but the length of the day remains predictable.

Describing key processes that change Earth’s surface

The surface of the Earth is continually shaped by natural processes that operate over both short and long periods of time. Weathering breaks down rocks through physical forces such as temperature changes, wind, and water, as well as through chemical reactions. Erosion then transports these broken materials by moving water, ice, wind, or gravity, while deposition occurs when sediments are dropped and settle in new locations. In addition, internal Earth processes such as volcanic activity, earthquakes, and tectonic plate movement can rapidly or gradually alter landscapes by forming mountains, valleys, and new landforms. Together, these processes demonstrate that while some features of Earth appear stable, the planet is constantly changing.

Explaining how changes in physical conditions affect living things

Even living things change. Children grow taller. Hair changes colour. Skills develop over time. Yet the basic structure of a human body remains the same.

Living things depend on specific physical conditions - such as temperature, water availability, light, and soil quality - to survive and grow. When these conditions change, organisms may need to adapt, migrate, or face decline. For example, changes in temperature can affect plant growth cycles, animal behaviour, and the availability of food sources. Alterations in rainfall can influence freshwater supplies and habitats, while changes in light levels affect photosynthesis in plants. Sudden changes, such as floods, fires, or droughts, can disrupt ecosystems quickly, whereas gradual changes may allow some species time to adjust. These relationships show how closely living things are connected to their physical environment and how environmental change can impact life.

Scientists learn by noticing both change and stability. They ask: *What is changing?* and *What is staying the same?* This helps them understand how systems work.

Understanding this difference helps people respond wisely to change. Not every change is a problem. Some change is part of healthy order.

Stability beneath change invites trust. It allows people to adapt without fear.

C) Narration

Narration Prompt:

“Tell me everything you remember about what changes and what stays the same.”

D) Teaching Skills (Explicit Instruction)

Science Teaching

- Some changes are part of cycles
- Some structures remain stable
- Stability allows safe change

Key Sentence:

“Change happens inside stable systems.”

Design & Technology Teaching

- Good designs allow controlled change

- Structures must remain stable
- Designers plan for movement and growth

Key Sentence:

“Good design stays steady while allowing change.”

E) Thinking Questions

F–2

- What changes in a day?
- What stays the same?

Years 3–4

- Why are seasons helpful?
- What would happen without order?

Years 5–6

- Why is stability important during change?
 - How does this connect to trust and reverence?
-

F) Practical Activities

Activity 1 – Change or Stable?

Sort examples into:

- Changes (weather, growth, light)
- Stable structures (earth, cycles, body plan)

Activity 2 – Design for Change

Design something that:

- Moves or changes
- Still stays strong

Explain how.

Portfolio Artefact #20:

Sorting chart or design sketch

G) Optional Extension (Years 5–6)

Compare two cycles (day/night vs seasons).

Explain how change and stability work together.

H) Biblical Connection & Wrap-Up

Parent Reads: “*Jesus Christ is the same yesterday, today, and forever.*” (Hebrews 13:8)

Wrap-Up Statement:

“Understanding stability during change helps us respond with confidence and reverence.”

Australian Curriculum v9 – Science (F–6)

Code	Description (Official Wording)	Justification (Linked to This Lesson)
AC9S1U02	Describe daily and seasonal changes in the environment and explore how these changes affect everyday life	The lesson repeatedly references day/night, seasons, predictable cycles, and how these changes occur within stable order.
AC9S3U02	Compare observable changes in materials and environments and identify that some changes are reversible and others are irreversible	The lesson distinguishes visible change (weathering, erosion, growth) from underlying stability, and contrasts temporary vs lasting change.
AC9S4U04	Examine how natural and human processes cause changes to Earth’s surface over time	The lesson explicitly explains weathering, erosion, deposition, volcanic activity, earthquakes, and tectonic movement as Earth-shaping processes.
AC9S5U01	Examine how particular structural features and behaviours of living things enable their survival in specific environments	The lesson explains how stable body plans, growth patterns, and environmental conditions support survival despite ongoing change.

Lesson 6.1 – Brains Made to Worship: Attention, Awe, and Design

Theme & Character Focus

Theme: Attention, Awe, and Purpose

Character Focus: Honour & Reverence – recognising that the human brain is designed for meaning, focus, and response, not just survival

Learning Objectives

Children will:

- Understand that the **brain processes information from the senses**
 - Recognise that humans are designed to **notice, focus, and respond**
 - Explore how attention shapes thoughts and actions
 - Learn that technology and environments can **guide attention**
 - Reflect on why directing attention wisely is an act of reverence
-

A) Introduction (Including Vocabulary to Pre-teach)

Parent/Tutor Says:

“Today we are going to learn about the human brain – not just what it looks like, but what it is designed to *do*. The brain helps us notice things, focus on them, and respond.”

Pre-teach Vocabulary

- **Brain** – the control centre of the body
- **Sense** – how we receive information (sight, sound, touch, taste, smell)
- **Attention** – focusing on something
- **Response** – how we react
- **Awe** – a feeling of wonder and respect
- **Purpose** – the reason something exists

Parent Action:

Ask children to sit quietly for 10 seconds and name everything they noticed.

B) Informational Story

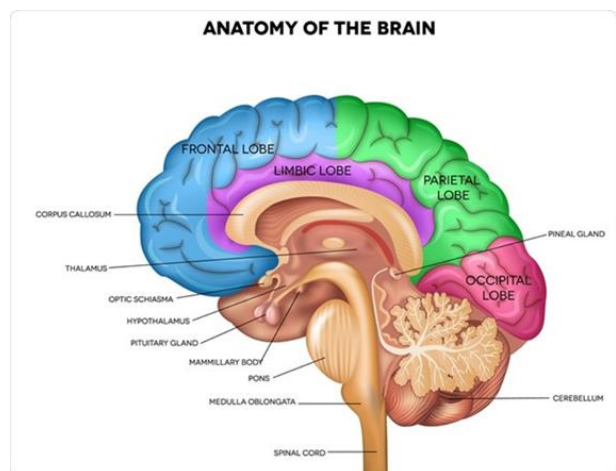
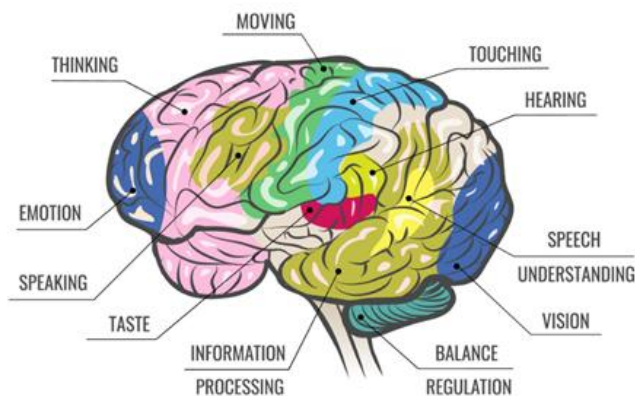
Parent/Tutor Says:

“I’m going to read you a story about how the brain works and why it matters what we pay attention to. Please listen carefully and picture what is happening inside the brain.”

Informational Story: “A Brain That Notices”

The human brain is one of the most complex structures in the world. It receives information from the eyes, ears, skin, nose, and tongue. Every second, it sorts, compares, and responds to this information.

But the brain cannot focus on everything at once. It must choose what to pay attention to. When something is loud, bright, or surprising, the brain notices it quickly. When something is calm or quiet, the brain must choose to focus.



<https://neurologyoffice.com/>

<https://www.news-medical.net/health/>

Humans are not like machines that only react automatically. People can stop, think, and respond with intention. The brain allows us to feel joy, recognise beauty, ask questions, and experience awe.

Throughout history, people have looked at the stars, listened to music, and gathered together to sing or pray. These activities draw attention upward and outward. They help people focus on something greater than themselves.

This shows that the brain is not designed only for survival. It is designed for **relationship, meaning, and worship**. What we give our attention to shapes what we become.

C) Narration

Narration Prompt

Parent/Tutor Says:

“Close your eyes and picture the brain receiving information and choosing what to notice. Tell me everything you remember.”

- Younger children narrate orally
- Older children may write or draw a brain-and-attention diagram

Portfolio Artefact #21:

Narration drawing or written explanation about attention

D) Teaching Skills (Explicit Instruction)

Science Teaching – Brain and Senses

Parent Explains:

- The brain receives sensory information
- Signals travel quickly through nerves
- The brain sorts and prioritises information
- Attention affects memory and response

Key sentence for children:

“The brain decides what to focus on.”

Design & Technology Teaching – Designing for Attention

Parent Explains:

- People design spaces, tools, and media to attract attention
- Colour, sound, movement, and repetition guide focus
- Design can be used to help or distract
- Wise design respects the mind

Key sentence for children:

“Design influences what people notice.”

E) Thinking Questions (Differentiated)

Foundation – Year 2

- What helps you notice something?
- What makes you feel calm or amazed?

Years 3–4

- Why can't the brain focus on everything at once?
- How do sounds or screens affect attention?

Years 5–6

- Why is attention powerful?
- How can directing attention be an act of respect or reverence?

Portfolio Artefact #22:

Recorded reflections or discussion notes

F) Practical Activities

Activity 1 – Attention Test (All Ages)

Task:

- Parent rings a bell or claps
- Ask children to raise a hand when they hear it
- Repeat with background noise
- Maybe have everyone making a noise and see how easy or difficult it is to notice a particular sound (such as Mum calling or teacher ringing a bell).

Science Focus: Sensory processing

Design Focus: Environmental influence on attention

Activity 2 – Designing an “Awe Space”

Task:

- Design a small space meant to encourage calm, focus, or wonder
- Draw or describe colours, sounds, and layout
- Explain why each choice helps attention

Portfolio Artefact #23:

Design sketch and explanation

G) Optional Extension Research Activity

Older Students (Years 5–6):

- Research how music, silence, or nature affects the brain
 - Compare effects on attention
 - Present findings respectfully
-

H) Biblical Connection & Wrap-up

Parent Reads:

“Be still, and know that I am God.” (Psalm 46:10)

Guided Discussion:

- Why is stillness important for attention?
- How does awe lead to reverence?
- What happens when attention is always distracted?

Wrap-up Statement (Parent):

“Respect and reverence begins with where we choose to look and listen.”

Prayer Focus:

Thankfulness for minds designed for meaning and wisdom to guide attention.

I) Content Descriptions Addressed

Science

Code	Full Description	Justification
AC9S2H01	Describe how people use science in daily lives	Understanding attention
AC9S3U01	Compare characteristics of living things	Brain function
AC9S6U01	Investigate conditions affecting survival	Sensory processing

Design & Technologies

Code	Full Description	Justification
AC9TDE4K01	Examine how design meets community needs	Awe space design
AC9TDE4P02	Generate and communicate design ideas	Sketching focus spaces
AC9TDE6K01	Explain how designers consider competing factors	Attention vs distraction
AC9TDE2P01	Communicate ideas through drawing or modelling	Design activity

Lesson 6.2 – Brain Structure & Habit Formation: Pathways, Practice, and Choice

Theme & Character Focus

Theme: Growth Through Practice and Choice

Character Focus: Honour & Reverence – recognising that repeated choices shape the brain and therefore deserve care, discipline, and wisdom

Learning Objectives

Children will:

- Learn that the brain has **different parts with different roles**
 - Understand that **habits form through repeated actions**
 - Explore how practice strengthens **neural pathways**
 - Recognise that environments and tools can **support or weaken good habits**
 - Reflect on why choosing habits wisely is an act of reverence
-

A) Introduction (Including Vocabulary to Pre-teach)

Parent/Tutor Says:

“In our last lesson we learned that the brain notices and focuses. Today we will learn that the brain also *changes* based on what we do again and again. This is called habit formation.”

Pre-teach Vocabulary

- **Habit** – something done repeatedly
- **Practice** – doing something again to improve
- **Pathway** – a route signals travel along
- **Structure** – parts arranged to work together
- **Choice** – a decision we make
- **Discipline** – choosing what is good over what is easy

Parent Action:

Ask children to name one thing they can now do better than when they were younger.

B) Informational Story

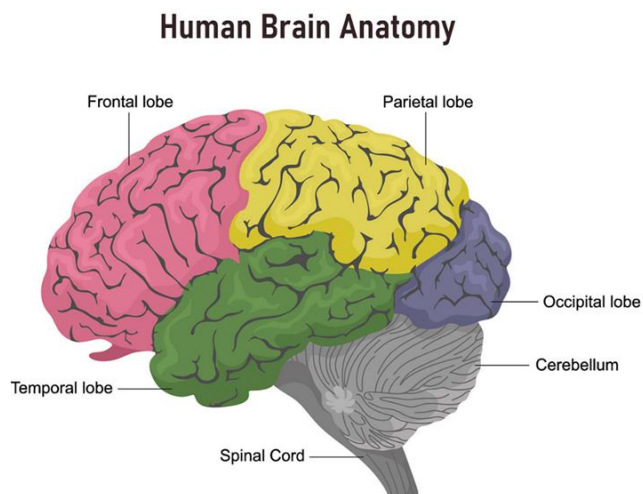
Parent/Tutor Says:

“I’m going to read you a story about how habits shape the brain. Please listen carefully and picture the brain changing as it learns.”

Informational Story: “Paths in the Mind”

The human brain is made up of different parts that work together. Some areas help us move, some help us feel, and some help us think and choose. All of these parts are connected by tiny pathways.

When a person does something for the first time, the brain must work hard to send signals along a new path. This is why learning something new can feel slow or difficult. But when the same action is repeated, the pathway becomes easier to use.



<https://www.hopkinsmedicine.org/>

Scientists describe this by saying that “paths in the brain become stronger with use.” Each time a pathway is used, the brain becomes more efficient. Over time, the action may feel automatic. This is called a habit.

Habits can be helpful or harmful. Practising kindness, reading, or music strengthens pathways that support learning and self-control. Repeating unhelpful behaviours also strengthens pathways, even if the result is not good.

This shows us that the brain is designed to grow and change. But it also shows us that **choice matters**. Because the brain responds to repetition, what we practise shapes who we become.

Understanding how habits form helps us act with honour and reverence toward ourselves and others. We are not trapped by habits, but we are responsible for what we practise.

C) Narration

Narration Prompt

Parent/Tutor Says:

“Close your eyes and picture pathways forming in the brain. Tell me what you remember about habits and practice.”

- Younger children narrate orally
- Older children may write or draw pathway diagrams

Portfolio Artefact #24:

Narration explanation (spoken, drawn, or written)

D) Teaching Skills (Explicit Instruction)

Science Teaching – Brain Plasticity (Age-Appropriate)

Parent Explains:

- The brain has different regions
- Signals travel along pathways
- Repetition strengthens pathways
- The brain can change over time

Key sentence for children:

“The brain grows in the direction it is used.”

Design & Technology Teaching – Designing Routines and Systems

Parent Explains:

- Routines are designed patterns of behaviour
- Tools and environments support habits
- Good design makes good choices easier
- Poor design makes bad habits easier

Key sentence for children:

“Design can help us practise what is good.”

E) Thinking Questions (Differentiated)

Foundation – Year 2

- What happens when you practise something?
- How does it feel when something becomes easier?

Years 3–4

- Why does repetition help learning?
- How can routines help good habits?

Years 5–6

- Why does understanding the brain increase responsibility?
- How can honour and reverence guide habit choices?

Portfolio Artefact #25:

Recorded reflections or discussion notes

F) Practical Activities

Activity 1 – Habit Pathway Demonstration (All Ages)

Task:

- Walk across a section of grass or a field or bush-track
- Walk the same path several times
- Observe how the path becomes clearer
- Think of something interesting that you noticed on your path/track. Then pose a question like a riddle for someone else to find that interesting thing, when they explore the same path/track.

Science Focus: Pathway strengthening

Design Focus: Visualising repetition effects

Activity 2 – Designing a Helpful Habit

Task:

- Choose one positive habit (reading, kindness, prayer, practice)
- Design a simple routine to support it
- Include time, place, and reminder

Portfolio Artefact #26:

Habit plan (drawing, chart, or written plan)

G) Optional Extension Research Activity

Older Students (Years 5–6):

- Research how long habits take to form
 - Compare practice in music or sport
 - Identify one way environment supports habits
-

H) Biblical Connection & Wrap-up

Parent Reads:

“Train up a child in the way he should go...” (Proverbs 22:6)

Guided Discussion:

- Why does training require repetition?
- How do habits shape character?
- Why is discipline an act of reverence?

Wrap-up Statement (Parent):

“What we practise becomes part of who we are.”

Prayer Focus:

Wisdom in choices, strength for good habits.

I) Content Descriptions Addressed

Science

Code	Full Description	Justification
AC9S3U01	Compare characteristics of living things	Brain adaptability
AC9S3I01	Pose questions based on observations	Habit pathway demo
AC9S6U01	Investigate conditions affecting growth and survival	Habit formation
AC9S3H02	Consider how explanations meet needs	Behaviour change

Design & Technologies

Code	Full Description	Justification
AC9TDE4P01	Explore needs and opportunities for designing solutions	Habit routines
AC9TDE4P02	Generate and communicate design ideas	Habit plans
AC9TDE6K01	Explain how designers consider competing factors	Discipline vs ease
AC9TDE2P04	Sequence steps cooperatively	Routine design

TOPIC 7	TECHNOLOGY OF CATHEDRALS

Lesson 7.1 – Cathedral Architecture: Height, Light, and Purpose

Theme & Character Focus

Theme: Building for Meaning and Community

Character Focus: Honour & Reverence – recognising that great structures were designed to lift hearts and minds, not merely to shelter bodies

Learning Objectives

Children will:

- Understand how **forces, materials, and shapes** enable tall buildings
 - Identify key architectural features of cathedrals
 - Learn how builders **designed structures** for stability, light, and sound
 - Explore how technology expresses **values and beliefs**
 - Reflect on why spaces designed for worship invite **reverence and care**
-

A) Introduction (Including Vocabulary to Pre-teach)

Parent/Tutor Says:

“Today we will study cathedrals – very tall stone buildings that took many years to build. They were designed not just to hold people, but to point hearts and thoughts upward.”

Pre-teach Vocabulary

- **Cathedral** – a large church building used for worship and gathering
- **Architecture** – the design of buildings
- **Vault** – a curved stone ceiling
- **Arch** – a curved structure that spreads weight
- **Buttress** – a support built outside a wall
- **Spire** – a tall pointed structure

Parent Action:

Show an image of a cathedral. Ask:

“What do you notice about its height and shapes?”

B) Informational Story

Parent/Tutor Says:

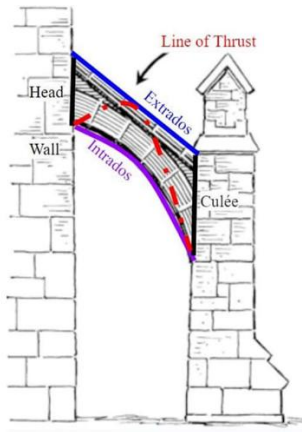
“I’m going to read you a story about how cathedrals were built and why they look the way they do. Please listen carefully and picture the building rising upward.”

Informational Story: “Building Upward”

During the Middle Ages, communities across Europe began building cathedrals. These buildings were much taller than ordinary homes and often took generations to complete. Builders wanted to create spaces that felt open, bright, and inspiring.

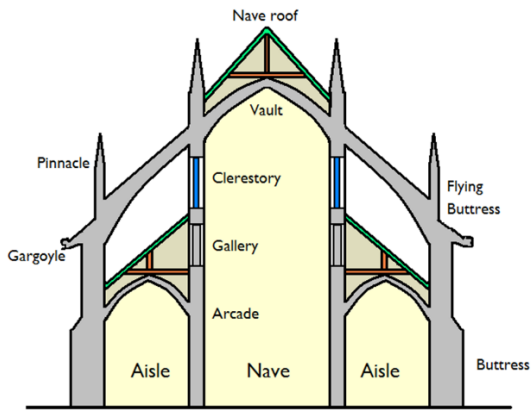
To build high walls and wide ceilings from heavy stone, architects needed to understand forces. Stone is strong when it is pressed down but weak when it is pulled apart. To solve this problem, builders used arches and vaults. Curved shapes redirect weight downward and outward instead of just straight down.

As cathedrals grew taller, walls became thinner. To prevent collapse, builders added flying buttresses – stone supports outside the building that carried weight away from the walls and into the ground. This allowed for large windows and more light inside.



<https://thevarsity.ca/2024/01/13/the-physics-of-flying-buttresses>

Cathedrals were carefully planned. Every column, arch, and support had a purpose. Builders considered how people would gather, sing, hear, and see. Light was especially important. Sunlight entering through high windows helped create a sense of awe.



https://commons.wikimedia.org/wiki/File%3ABasilica_%28architecture%29_schematic_section.png

These buildings show how science and technology can be used to express meaning. Cathedral architecture combined engineering skill with spiritual purpose. The goal was not speed or profit, but endurance, beauty, and reverence.



<https://maryannesfrance.com/things-to-do/attractions/>

Studying cathedrals reminds us that technology reflects what people value. When buildings are designed with care and meaning, they can shape how people think and feel for centuries.

C) Narration

Narration Prompt

Parent/Tutor Says:

“Close your eyes and picture a cathedral rising higher and higher. Tell me everything you remember about how it stays standing.”

- Younger children narrate orally
- Older children may draw and label key features

Portfolio Artefact #27:

Narration drawing or written explanation of cathedral structure

D) Teaching Skills (Explicit Instruction)

Science Teaching – Forces and Stability

Parent Explains:

- Gravity pulls weight downward
- Arches and vaults spread force
- Buttresses transfer force safely
- Stable buildings guide force into the ground

Key sentence for children:

“Curved shapes help buildings stay strong.”

Design & Technology Teaching – Designing for Purpose

Parent Explains:

- Builders design for **use, safety, and meaning**
- Shape affects strength and light
- Design choices reflect values
- Long-term projects require planning and cooperation

Key sentence for children:

“Good design serves people and purpose.”

E) Thinking Questions (Differentiated)

Foundation – Year 2

- Why do cathedrals look tall?
- What shapes help them stay strong?

Years 3–4

- How do buttresses help tall walls?
- Why was light important inside cathedrals?

Years 5–6

- How does architecture express beliefs?
- Why does honour and reverence matter in design?

Portfolio Artefact #28:

Recorded reflections or discussion notes

F) Practical Activities

Activity 1 – Arch and Support Test (All Ages)

Materials:

- Books
- Cardboard or paper
- Blocks or cups

Task:

1. Build a flat roof and test weight
2. Build an arch and test weight
3. Add “buttress” supports and test again

Science Focus: Force distribution

Design Focus: Structural problem-solving

Activity 2 – Design a Mini Cathedral

Task:

- Sketch a tall building
- Label arches, vaults, buttresses, and windows
- Explain one design choice

G) Optional Extension Research Activity

Older Students (Years 5–6):

- Research a famous cathedral
 - Identify one engineering feature
 - Explain how it supports worship or community
-

H) Biblical Connection & Wrap-up

Parent Reads:

“Let us go into His dwelling place.” (Psalm 132:7)

Guided Discussion:

- Why do spaces matter in worship?
- How can buildings encourage reverence?
- How should places of gathering be treated?

Wrap-up Statement (Parent):

“Spaces shape hearts when they are designed with purpose.”

Prayer Focus:

Gratitude for places that help people gather and worship.

I) Content Descriptions Addressed

Science

Code	Full Description	Justification
AC9S4U03	Identify how forces affect motion and stability	Arches and buttresses
AC9S3U02	Compare properties of materials	Stone strength
AC9S4H01	Examine how people use data to develop explanations	Structural design

Design & Technologies

Code	Full Description	Justification
AC9TDE4K02	Describe how forces and material properties affect function	Cathedral supports
AC9TDE4P01	Explore needs and test materials and processes	Support testing
AC9TDE4P02	Generate and communicate design ideas	Mini cathedral design
AC9TDE6K05	Explain how properties affect use	Stone and height

Lesson 7.2 – Making Stained Glass: Light, Colour, and Meaning

Theme & Character Focus

Theme: Light Shaped by Design

Character Focus: Honour & Reverence – recognising light as a gift that can be shaped to teach, inspire, and communicate meaning

Learning Objectives

Children will:

- Understand how **light interacts with coloured glass**
 - Explore how stained glass windows were **designed and made**
 - Learn how materials and structure affect **colour, brightness, and strength**
 - Recognise how technology can be used to **communicate stories and values**
 - Reflect on why shaping light for meaning requires **care and reverence**
-

A) Introduction (Including Vocabulary to Pre-teach)

Parent/Tutor Says:

“In the last lesson we learned how cathedrals were built to reach upward. Today we will learn how light was brought *inside* through stained glass windows.”

Pre-teach Vocabulary

- **Stained glass** – coloured glass arranged to form images
- **Light** – energy that allows us to see
- **Colour** – light reflected or transmitted by materials
- **Transparent** – allowing light through
- **Lead came** – soft metal strips holding glass pieces
- **Symbol** – an image that represents meaning

Parent Action:

Hold coloured cellophane or paper up to a window. Ask how the light changes.

B) Informational Story

Parent/Tutor Says:

“I’m going to read you a story about stained glass windows. Please listen carefully and imagine light passing through colour.”

Informational Story: “Stories in the Light”

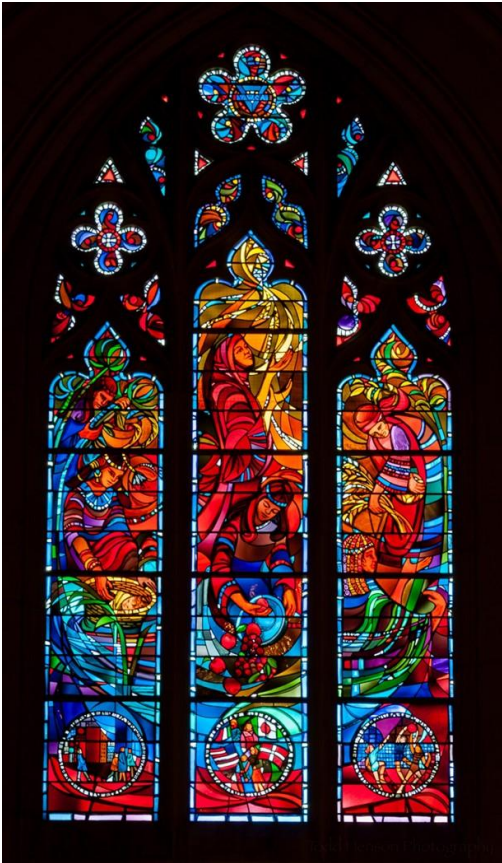
In medieval cathedrals, windows were more than openings for light. They were carefully designed artworks made from coloured glass. When sunlight passed through them, the light inside the building changed colour and mood.

Glassmakers learned that adding certain minerals to melted glass changed its colour. Copper made glass green or blue. Gold could create deep reds. When the glass cooled, the colour remained part of the material.

Pieces of coloured glass were cut into shapes and joined together using thin strips of lead called “lead came”. The lead was soft enough to bend but strong enough to hold the glass in place. This allowed large windows to be built from many smaller pieces.



Stained glass windows often told stories. Pictures showed important events, lessons, or symbols. In a time when many people could not read, light and colour became tools for teaching.



The science of stained glass shows how materials affect light. The technology shows how design shapes meaning. Builders did not try to make the brightest windows possible. They chose colours and patterns carefully to create a space that felt thoughtful and reverent.

Stained glass reminds us that technology can shape how people see the world – literally and figuratively. Because light draws attention, it should be guided with wisdom and respect.



C) Narration

Narration Prompt

Parent/Tutor Says:

“Close your eyes and picture sunlight shining through coloured glass. Tell me everything you remember about how stained glass is made and used.”

- Younger children narrate orally
- Older children may draw a window design or write a short explanation

Portfolio Artefact #30:

Narration drawing or written explanation of stained glass

D) Teaching Skills (Explicit Instruction)

Science Teaching – Light and Colour

Parent Explains:

- Light travels in straight lines

- Coloured glass filters light
- Some colours are absorbed; others pass through
- Transparent materials allow light to travel

Key sentence for children:

“Colour changes how light reaches our eyes.”

Design & Technology Teaching – Designing with Materials

Parent Explains:

- Glass is chosen for transparency
- Lead is chosen for flexibility and strength
- Designs must balance **beauty and stability**
- Good design communicates meaning clearly

Key sentence for children:

“Materials are chosen for what they do best.”

E) Thinking Questions (Differentiated)

Foundation – Year 2

- What happens to light when it goes through coloured glass?
- How do the colours make you feel?

Years 3–4

- Why do stained glass windows use many small pieces?
- How does colour help tell a story?

Years 5–6

- Why does shaping light increase responsibility?
- How should honour and reverence guide visual design?

Portfolio Artefact #31:

Recorded reflections or discussion notes

F) Practical Activities

Activity 1 – Create a “Stained Glass” Window (All Ages)

Materials:

- Clear plastic sheet or baking paper

- Coloured tissue paper or cellophane
- Glue or tape

Task:

- Arrange coloured pieces into a design
- Attach to a window
- Observe colour changes as light passes through

Science Focus: Light transmission

Design Focus: Visual communication

Activity 2 – Colour & Meaning Chart

Task:

- Choose 3 colours
- Describe how each colour feels or what it represents
- Discuss why artists choose colours carefully

Portfolio Artefact #32:

Window design and colour-meaning explanation

G) Optional Extension Research Activity

Older Students (Years 5–6):

- Research symbols used in stained glass
 - Explain how images taught lessons
 - Compare medieval and modern window designs
-

H) Biblical Connection & Wrap-up

Parent Reads:

“The light shines in the darkness.” (John 1:5)

Guided Discussion:

- Why is light used as a symbol?
- How can colour and beauty point to truth?
- Why should light be used carefully?

Wrap-up Statement (Parent):

“Light guided by wisdom can teach and inspire.”

Prayer Focus:

Thankfulness for beauty, light, and understanding.

I) Content Descriptions Addressed

Science

Code	Full Description	Justification
AC9S5U03	Identify sources of light and how light travels	Light through glass
AC9S3U02	Compare observable properties of materials	Glass and lead
AC9S4U04	Examine properties of natural and made materials	Coloured glass
AC9S3H02	Consider how scientific explanations meet needs	Lighting spaces

Design & Technologies

Code	Full Description	Justification
AC9TDE4K02	Describe how material properties affect function	Glass and lead
AC9TDE4P02	Generate and communicate design ideas	Window design
AC9TDE4P03	Select and use materials safely	Craft activity
AC9TDE6K05	Explain how properties affect use	Transparency and strength

TOPIC

8

ETHICS IN SCIENCE

Lesson 8.1 – The Limitations of Science: What Science Can and Cannot Answer



<https://www.amazon.com/Educational-Insights-GeoSafari-Telescope-Microscope/dp/B000A3Y12S>

Theme & Character Focus

Theme: Knowledge with Humility

Character Focus: Honour & Reverence – recognising that science is powerful but limited, and that wisdom requires humility about what we can and cannot know through science alone

Learning Objectives

Children will:

- Understand what **science is designed to do**
- Recognise the **limits of scientific investigation**
- Distinguish between **scientific questions** and **other kinds of questions**
- Learn that technology applies scientific knowledge but also has limits
- Reflect on why humility and reverence are essential when using knowledge

A) Introduction (Including Vocabulary to Pre-teach)

Parent/Tutor Says:

“Throughout this course, we have seen how science helps us understand the world. Today we will learn something very important: science is powerful, but it does not answer every kind of question.”

Pre-teach Vocabulary

- **Science** – the study of the natural world through observation and testing
- **Limit** – a boundary that should not be crossed
- **Evidence** – information gained through observation
- **Measurement** – comparing something using numbers or tools
- **Meaning** – why something matters
- **Wisdom** – knowing how to use knowledge well

Parent Action:

Ask children: “What are some questions science can answer?” Then ask: “What are some questions science cannot answer?”

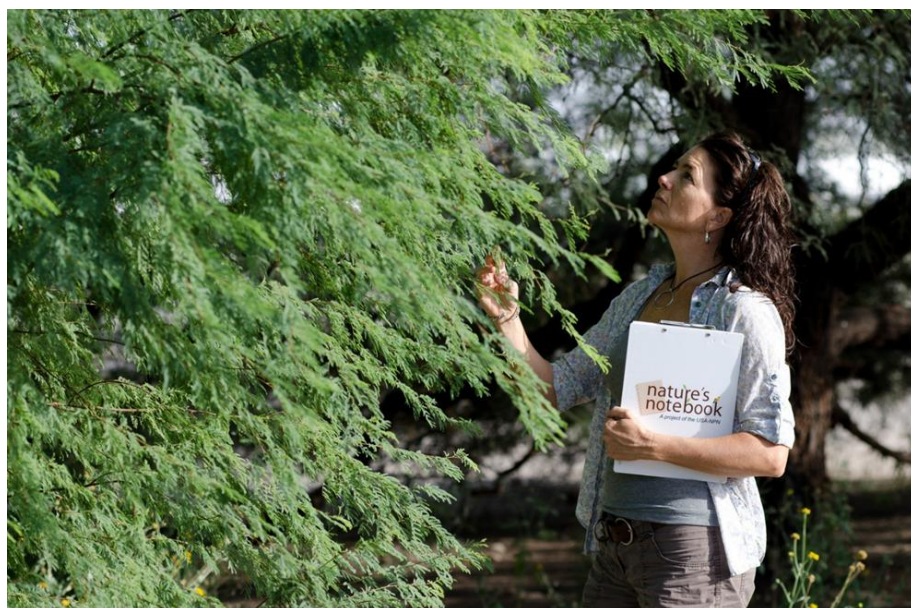
B) Informational Story

Parent/Tutor Says:

“I’m going to read you a story about what science can and cannot do. Please listen carefully and think about the kinds of questions being asked.”

Informational Story: “Good at Some Questions”

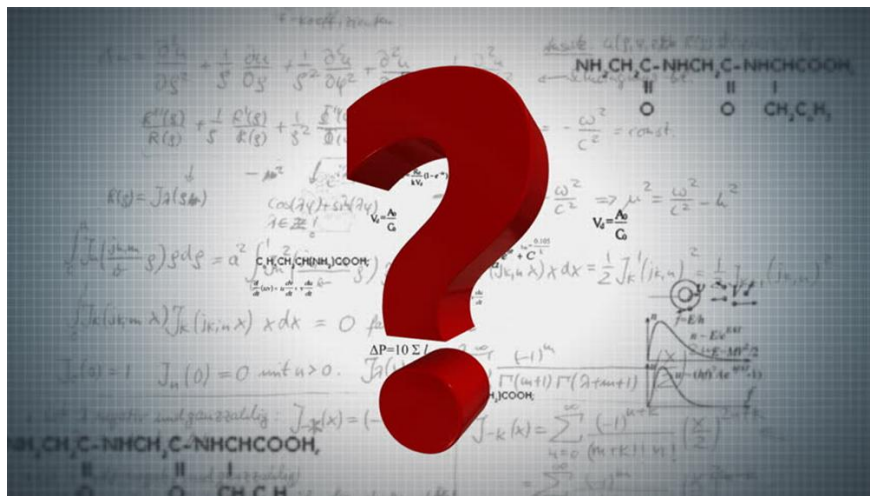
Science is very good at answering certain kinds of questions. It can tell us how fast something moves, what materials are made of, and how heat or light behaves. Scientists use tools, experiments, and careful measurements to discover patterns in the natural world.



<https://pages.scistarter.org/2014/05/natures-notebook/>

Because of this, science has helped people build bridges, grow food, cure diseases, and explore space. These are all important achievements.

But science has limits. Science can describe *how* something works, but it cannot decide *why* something matters. It can measure brain activity, but it cannot measure love. It can study sound waves, but it cannot tell us whether music is beautiful. It can explain how a body works, but not why a person has value.



These are not scientific questions – they are questions of meaning, purpose, and ethics.

Problems arise when people expect science to answer questions it was never designed to answer. When science is treated as the only source of truth, other important ways of knowing are ignored.

Understanding the limits of science helps us use it well. It reminds us to be humble, to listen, and to seek wisdom beyond measurements alone. Reverence begins when we recognise that knowledge is a gift, not a replacement for truth.

C) Narration

Narration Prompt

Parent/Tutor Says:

“Close your eyes and think about what science can answer and what it cannot. Tell me everything you remember from the story.”

- Younger children narrate orally
- Older children may write a short comparison or draw a chart

Portfolio Artefact #33:

Narration explaining limits of science

D) Teaching Skills (Explicit Instruction)

Science Teaching – What Science Does Well

Parent Explains:

- Science studies observable things
- Science uses evidence and testing
- Science looks for patterns
- Science explains how systems work

Key sentence for children:

“Science answers ‘how’ questions.”

Design & Technology Teaching – Applying Knowledge Wisely

Parent Explains:

- Technology applies scientific knowledge
- Not every problem is technical
- Some decisions require values and ethics
- Design should serve people, not control them

Key sentence for children:

“Not everything that can be made should be made.”

E) Thinking Questions (Differentiated)

Foundation – Year 2

- Can science tell us how fast something moves?
- Can science tell us what is kind?

Years 3–4

- Why can science not measure love or beauty?
- What happens if people forget science has limits?

Years 5–6

- Why is it dangerous to treat science as the only authority?
- How does humility protect people when using knowledge?

Portfolio Artefact #34:

Recorded reflections or discussion notes

F) Practical Activities

Activity 1 – Sorting Questions (All Ages)

Task:

Sort questions into two groups:

Science Can Answer

- How does sound travel?
- What happens when water freezes?

Science Cannot Answer

- Why should we tell the truth?
- What makes a life meaningful?

Science Focus: Nature of inquiry

Design Focus: Identifying problem types

Activity 2 – Designing a Wise Rule

Task:

- Create a simple rule for using technology wisely
- Explain why the rule matters
- Share with others

Portfolio Artefact #35:

Written or drawn “wisdom rule”

G) Optional Extension Research Activity

Older Students (Years 5–6):

- Research a historical example where science was misused
 - Identify what was missing (ethics, humility, care)
 - Present findings respectfully
-

H) Biblical Connection & Wrap-up

Parent Reads:

“The fear of the Lord is the beginning of wisdom.” (Proverbs 9:10)

Guided Discussion:

- Why does wisdom begin with reverence?
- How can science and faith work together?
- Why do limits protect people?

Wrap-up Statement (Parent):

“Knowledge grows best when guided by humility.”

Prayer Focus:

Thankfulness for knowledge and wisdom to use it rightly.

I) Content Descriptions Addressed

Science

Code	Full Description	Justification
AC9S3H01	Examine how people use data to develop explanations	Role of science
AC9S5H02	Investigate how scientific knowledge is used	Limits discussion
AC9S6H02	Investigate how science is used to make decisions	Ethics framing

Design & Technologies

Code	Full Description	Justification
AC9TDE4K01	Examine factors impacting design	Ethics and limits
AC9TDE6K01	Explain competing factors in design	Values vs capability
AC9TDE4P04	Evaluate design ideas using criteria	Wise-rule activity
AC9TDE6P04	Negotiate design criteria including sustainability	Responsible use

Lesson 8.2 – Ethics in Action: Using Science to Build or Destroy, to Heal or Harm

Theme & Character Focus

Theme: Responsibility in Knowledge and Power

Character Focus: Honour & Reverence – choosing to use scientific knowledge to serve life, protect people, and act justly

Learning Objectives

Children will:

- Understand that **science and technology are tools** that can be used in different ways
 - Identify examples of science used to **help or harm**
 - Learn how **ethical choices** guide technological use
 - Apply criteria to **evaluate decisions** involving science
 - Complete a **capstone portfolio reflection** demonstrating wisdom and reverence
-

A) Introduction (Including Vocabulary to Pre-teach)

Parent/Tutor Says:

“In the last lesson, we learned that science has limits. Today we will learn that even when science *can* do something, people must decide whether it *should* be done.”

Pre-teach Vocabulary

- **Ethics** – deciding what is right and wrong
- **Responsibility** – being accountable for choices
- **Technology** – applying scientific knowledge
- **Consequence** – what happens because of a choice
- **Justice** – acting fairly and rightly
- **Stewardship** – caring wisely for what we are given

Parent Action:

Ask children to name a tool and describe how it could be used in a good way or a harmful way.

B) Informational Story

Parent/Tutor Says:

“I’m going to read you a story about choices people make when they use science. Please listen carefully and think about the outcomes.”

Informational Story: “The Same Knowledge, Different Choices”

Scientific knowledge gives people power. That power can be used to heal sickness, grow food, build shelter, and protect life. The same knowledge can also be used to pollute land, harm people, or control others.

For example, understanding chemistry allows people to make medicines that save lives. The same understanding can be used to create harmful substances. Knowledge itself does not decide the outcome – **people do.**

Technology magnifies choices. A small decision can affect many people when machines, systems, and networks are involved. This is why ethical thinking must grow alongside scientific ability.

Wise decision-making asks important questions:

Who will this help?

Who might it harm?

Is this respectful of life and creation?

Does this serve others or only ourselves?

Throughout history, the most beneficial uses of science have been guided by humility, compassion, and responsibility. When these are missing, even impressive technology can cause great harm.

Ethics reminds us that science is a servant, not a master. Having a reverent attitude helps us pause before acting and choose paths that build rather than destroy.

C) Narration

Narration Prompt

Parent/Tutor Says:

“Close your eyes and think about science being used to help or harm. Tell me everything you remember from the story.”

- Younger children narrate orally
- Older children may write a summary or create a comparison chart

Portfolio Artefact #36:

Narration demonstrating ethical understanding

D) Teaching Skills (Explicit Instruction)

Science Teaching – Knowledge and Impact

Parent Explains:

- Science provides understanding
- Technology applies that understanding
- Impact depends on human choice
- Consequences can be long-lasting

Key sentence for children:

“Knowledge gives power, but choices guide outcomes.”

Design & Technology Teaching – Ethical Evaluation

Parent Explains:

- Designers evaluate risks and benefits
- Ethical design considers people, environment, and future
- Sustainability and justice matter
- Good design protects life

Key sentence for children:

“Wise design asks who is helped and who is harmed.”

E) Thinking Questions (Differentiated)

Foundation – Year 2

- Can the same tool be used in good or bad ways?
- Why should we be careful with powerful tools?

Years 3–4

- Why doesn't knowledge automatically lead to good choices?
- How can rules help protect people?

Years 5–6

- Why must ethics guide scientific progress?
- How does honour and reverence affect decision-making?

Portfolio Artefact #37:

Recorded responses or reflection notes

F) Practical Activities

Activity 1 – Build or Harm Sorting Task (All Ages)

Task:

Sort examples into two columns (with discussion):

Build / Heal

- Clean water systems
- Medical imaging
- Renewable energy

Destroy / Harm

- Pollution dumping
- Unsafe experiments
- Wasteful resource use

Science Focus: Application of knowledge

Design Focus: Evaluating outcomes

Activity 2 – Ethical Decision Scenario

Task:

Present a simple scenario (e.g., new technology that saves time but harms environment).

Children decide:

- What are the benefits?
- What are the harms?
- What is the wisest choice?

Portfolio Artefact #38 (Capstone):

Written, drawn, or oral ethical decision explanation

G) Optional Extension Research Activity

Older Students (Years 5–6):

- Research one technology used for good (e.g., vaccines, clean energy)
 - Research one misuse of technology
 - Compare outcomes and lessons learned
-

H) Biblical Connection & Wrap-up

Parent Reads:

“Act justly, love mercy, and walk humbly.” (Micah 6:8)

Guided Discussion:

- Why does humility matter with power?
- How can science be used as a servant?
- What does reverence look like in decision-making?

Wrap-up Statement (Parent):

“True wisdom uses knowledge to serve, not to control.”

Prayer Focus:

Guidance to choose what builds, heals, and protects life.

I) Content Descriptions Addressed

Science

Code	Full Description	Justification
AC9S5H02	Investigate how scientific knowledge is used by communities	Build vs harm
AC9S6H02	Investigate how science informs decisions	Ethical scenarios
AC9S3H02	Consider how explanations meet needs	Beneficial uses

Design & Technologies

Code	Full Description	Justification
AC9TDE4K01	Examine factors impacting design	Ethics and consequences
AC9TDE6K01	Explain competing factors in design	Benefit vs harm
AC9TDE4P04	Evaluate design ideas using criteria	Scenario evaluation
AC9TDE6P04	Negotiate design criteria including sustainability	Capstone task

TOPIC 9	CULMINATING PROJECT OR ASSESSMENT

Assessment Task Instructions

Science & Design & Technologies Portfolio

Purpose of the Assessment

This assessment allows students to demonstrate:

- Scientific understanding developed across the course
- Design thinking and problem-solving skills
- Ethical reasoning and responsible decision-making
- Growth in the character trait of **Honour & Reverence**

The assessment is **portfolio-based**, meaning students collect evidence gradually from each lesson rather than completing a single test.

Assessment Overview

Assessment Type: Portfolio

Assessed Areas:

- Science Understanding
- Science Inquiry Skills
- Design & Technologies Knowledge
- Design Process (Investigate → Design → Evaluate)
- Ethical Reasoning
- Communication
- Character Development (Honour & Reverence)

Submission Format (choose one):

- Physical folder
- Digital folder (photos, scans, typed responses)
- Mixed format

Student Task Instructions (Child-Friendly)

Your Task

You will create a **Science & Technology Portfolio** that shows:

- What you learned about science and materials
- How people design and use technology
- How choices can help or harm
- How reverence and wisdom guide knowledge

Your Portfolio Must Include

You will select **at least one example from each topic**:

1. **A scientific explanation** (drawing, model, or writing)
2. **A design activity** (plan, model, or test)
3. **An investigation or observation**
4. **An ethical reflection** (right vs wrong use of science)

Your final piece will be an **Ethical Decision Task** from Topic 8.

Parent / Tutor Instructions

- Evidence is collected **during normal lessons**
 - Younger students may respond orally or through drawings
 - Older students should include labels, explanations, and reflections
 - Students are **not compared to each other**
 - Assessment focuses on **progress, understanding, and care**
-

Assessment Portfolio Checklist

Requirement	Evidence Included
Scientific explanation (materials, forces, light, life, or sound)	☐
Investigation or experiment record	☐
Design sketch or model	☐
Design evaluation (what worked / didn't)	☐
Ethical reflection (build vs harm)	☐
Final ethical decision task (Topic 8)	☐

Five-Level Assessment Rubrics

Each rubric uses **five levels of competency**, as requested.

Rubric 1 – Science Understanding

Level	Descriptor
5 – Insightful	Explains scientific ideas clearly, accurately, and connects them across topics
4 – Proficient	Explains scientific ideas accurately with relevant examples
3 – Developing	Shows basic understanding of scientific ideas with some support
2 – Beginning	Identifies some scientific ideas with limited explanation
1 – Emerging	Shows minimal recognition of scientific ideas

Rubric 2 – Science Inquiry & Investigation

Level	Descriptor
5 – Insightful	Plans investigations thoughtfully and explains results clearly
4 – Proficient	Conducts investigations and records observations clearly
3 – Developing	Participates in investigations with partial recording
2 – Beginning	Observes investigations with guidance
1 – Emerging	Limited engagement with investigation activities

Rubric 3 – Design & Technologies Knowledge

Level	Descriptor
5 – Insightful	Explains how materials, forces, or systems affect design choices
4 – Proficient	Identifies how properties affect function
3 – Developing	Recognises basic links between materials and use
2 – Beginning	Identifies materials with limited understanding of function
1 – Emerging	Limited recognition of design features

Rubric 4 – Design Process (Investigate, Design, Evaluate)

Level	Descriptor
5 – Insightful	Designs, tests, and improves solutions thoughtfully
4 – Proficient	Designs and evaluates solutions with explanation
3 – Developing	Produces a basic design with limited evaluation
2 – Beginning	Attempts a design with guidance

Level	Descriptor
1 – Emerging	Minimal engagement in design process

Rubric 5 – Ethical Reasoning

Level	Descriptor
5 – Insightful	Clearly evaluates consequences and applies ethical principles
4 – Proficient	Explains right and wrong use of science
3 – Developing	Identifies helpful vs harmful uses with support
2 – Beginning	Recognises good or bad outcomes without explanation
1 – Emerging	Limited awareness of ethical considerations

Rubric 6 – Communication

Level	Descriptor
5 – Insightful	Communicates ideas clearly using multiple formats
4 – Proficient	Communicates ideas clearly in chosen format
3 – Developing	Communicates ideas with some clarity
2 – Beginning	Communicates ideas with support
1 – Emerging	Limited communication of ideas

Rubric 7 – Character: Honour & Reverence

Level	Descriptor
5 – Deeply Evident	Consistently shows reverence, humility, and responsibility
4 – Evident	Often shows care and respect in learning and choices
3 – Developing	Shows growing awareness of reverence
2 – Emerging	Shows occasional respect with reminders
1 – Limited	Limited demonstration of reverence

Final Teacher / Parent Judgement

Area	Level (1–5)
Science Understanding	☐
Inquiry Skills	☐
Design & Technologies	☐
Design Process	☐
Ethical Reasoning	☐

Area	Level (1–5)
Communication	☐
Honour & Reverence	☐

Overall Achievement:

☐ Emerging ☐ Developing ☐ Sound ☐ Proficient ☐ Highly Developed

APPENDIX:

Science & Technology Course Sequence (0–6)

Character Focus: Honour & Reverence
Assessment Model: Progressive Portfolio

TOPIC 1 – Dimensions of Life

(FOUNDATIONAL CONCEPTUAL FRAME)

Lessons 1.1 & 1.2 – already completed

1.1 Science & the Bible

Focus

- Science as discovery, not invention
- Order, pattern, humility, reverence

Portfolio Artefacts

- “*Patterns I Observed*” page
 - Personal reflection on wonder & reverence
-

1.2 Four States, Ten Dimensions

Focus

- Matter: solid, liquid, gas, plasma
- Seen vs unseen reality
- Limits of human perception

Portfolio Artefacts

- Matter classification chart
 - Diagram: “*Things we see / Things we don’t usually see*”
-

TOPIC 2 – Bread & Wine

(Food Science & Design)

2.1 How Bread Is Made

Science Focus

- Physical and chemical change
- Heat, gases, mixtures

Design & Technology Focus

- Food preparation processes
- Sequencing steps safely

Portfolio Artefacts

- Bread-making process flowchart
 - Observation notes (texture, smell, change)
-

2.2 How Wine Is Made

Science Focus

- Fermentation (conceptual, non-sensational)
- Microorganisms and change

Design & Technology Focus

- Managed food production
- Ethical use of processes

Portfolio Artefacts

- Fermentation comparison chart (bread vs grapes)
 - Reflection: *“Processes must be used wisely”*
-

TOPIC 3 – The Colosseum

(Engineering & Sound)

3.1 Colosseum Architecture

Science Focus

- Forces, materials, structure

Design & Technology Focus

- Engineering principles
- Material properties and function

Portfolio Artefacts

- Structural sketch with labelled materials

- Test notes: “Which shapes are strongest?”
-

3.2 Acoustics of an Amphitheatre

Science Focus

- Sound energy and vibration

Design & Technology Focus

- Designing for communication
- Function meeting human needs

Portfolio Artefacts

- Sound reflection experiment record
 - Model or diagram of sound travel
-

TOPIC 4 – Order, Patterns & Change in Creation

(Conceptual Systems Science – NEW REPLACEMENT TOPIC)

4.1 Order, Patterns & Laws of Nature

Science Focus

- Observable patterns in nature
- Scientific laws as descriptions of consistency

Design & Technology Focus

- Designing in alignment with natural laws
- Respecting limits and constraints

Portfolio Artefacts

- Pattern identification record
 - Prediction task: “What comes next and why?”
-

4.2 Change vs Stability in the Natural World

Science Focus

- Cycles, change, and stability
- Surface change vs structural continuity

Design & Technology Focus

- Designing systems that allow controlled change
- Stability as a foundation for function

Portfolio Artefacts

- Sorting chart: *Change / Stable*
 - Design sketch: *“Stable but adaptable”*
-

TOPIC 5 – Brain Science

(Attention, Habit & Systems)

5.1 Brains Made to Worship

Science Focus

- Basic brain structure
- Sensory input and response

Design & Technology Focus

- Systems working together

Portfolio Artefacts

- Age-appropriate brain diagram
 - Reflection: *“What captures attention?”*
-

5.2 Brain Structure & Habit Formation

Science Focus

- Neural pathways (conceptual)

Design & Technology Focus

- Designing routines
- Systems over time

Portfolio Artefacts

- Habit loop diagram
 - Personal plan: *“Designing good habits”*
-

TOPIC 6 – The Technology of Art

(Materials & Communication)

6.1 Edicts on Scrolls (Paper Making)

Science Focus

- Materials and properties

Design & Technology Focus

- Traditional technologies
- Making for communication

Portfolio Artefacts

- Handmade paper sample
 - Process evaluation
-

6.2 Science of Pottery

Science Focus

- Heat and irreversible change

Design & Technology Focus

- Material transformation
- Form and function

Portfolio Artefacts

- Clay object or model
 - Before/after comparison notes
-

TOPIC 7 – Technology of Cathedrals

(Large-Scale Systems & Meaning)

7.1 Cathedral Architecture

Science Focus

- Forces, balance, load

Design & Technology Focus

- Large-scale systems
- Design for purpose and meaning

Portfolio Artefacts

- Cathedral cross-section sketch
 - Explanation of structural choices
-

7.2 Making Stained Glass

Science Focus

- Light, colour, transparency

Design & Technology Focus

- Material choice
- Aesthetic + function

Portfolio Artefacts

- Stained glass design (paper/acrylic)
 - Reflection: *“Light reveals meaning”*
-

TOPIC 8 – Ethics in Science

(Wisdom, Limits & Responsibility)

8.1 Limitations of Science

Science Focus

- What science can and cannot answer

Design & Technology Focus

- Responsible problem-solving

Portfolio Artefacts

- T-chart: *“Science can / Science cannot”*
 - Reflection on humility
-

8.2 Ethics: Build or Destroy (*FINAL*)

Science Focus

- Application of knowledge

Design & Technology Focus

- Ethical decision-making
- Sustainability and responsibility

Portfolio Artefacts (Culminating)

- Final portfolio reflection
- Case study: science used wisely or wrongly
- Personal commitment statement