



HISTORY

YEAR 1

Student Explorer

⌘ GRADES 7-8 ⌘

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INSTRUCTIONS

This *Student Explorer* accompanies *The Good and the Beautiful History: Year 1* course. It contains all the activity pages that are needed to complete the course. Each student will need a copy of the *Student Explorer*.

The history lesson extensions are also found here. These extensions are optional for older students (grades 7–8) to complete on their own. Each extension is accompanied by comprehension questions and/or extension activities.

Have each student spend enough time to create high-quality work as the activities are completed. Students may enjoy looking back on their past discoveries after they have finished.

WHAT CAN WE LEARN?

LESSON
2

Fill in the blanks to complete the statements about what we can learn from people in the Bible.

Like _____ and _____ ,
we can overcome hardship
and give thanks to God.



We can learn from the story
of _____ and _____ to
love one another instead of
giving in to feelings of anger.



From _____ , we can
learn to follow God's
commandments in the
way God has asked.



Like _____ , we can
choose to follow God even
if people around us are not.



LESSON 2 EXTENSION

GENEALOGY

Read the following and complete the activity at the end of the extension:

Have you ever heard true stories passed down by your family members or read an old journal that belonged to an ancestor? While generalizations can sometimes be made about large groups of people, family history is completely unique to each person. Your ancestors' homeland, traditions, and experiences may be completely different from a friend's! The study of family history is known as **genealogy**—a word that originates from the Greek words for "family" and "the study of." Today, genealogists are like puzzle solvers, piecing together family trees from ancient to modern times and filling in the holes with historical records. But genealogy has always been a part of society, and it varies from culture to culture. Let us take a look at different kinds of genealogy throughout history.



Long before and even after written records were created, ancient peoples passed on their culture and family history through stories. This was called **oral tradition**. It may sound much simpler than modern genealogy, but keeping track of family trees without written records was hard work! In Eastern Europe

many great poets and storytellers memorized patterns and repetition in their stories to recall thousands of lines. Some cultures even had visual references to aid them in their storytelling. The Incas used collections of cords tied into patterned knots called **quipu** [KEE-poo] to represent people, dates, and even events—a tradition that is still practiced in multiple cultures throughout South America today.



quipu cords

You learned about an important family line in today's lesson. Did you know that some of the oldest known genealogies are actually in the Bible? You may have read some of them in your own studies—long lists of names detailing who was the parent of whom. One of the most significant biblical genealogies is in Chapter 3 of the book of Luke in the New Testament, which traces the family lineage from Jesus Christ all the way back to Adam. Is it not amazing that so many years, generations, and stories can be summed up in only a few verses?

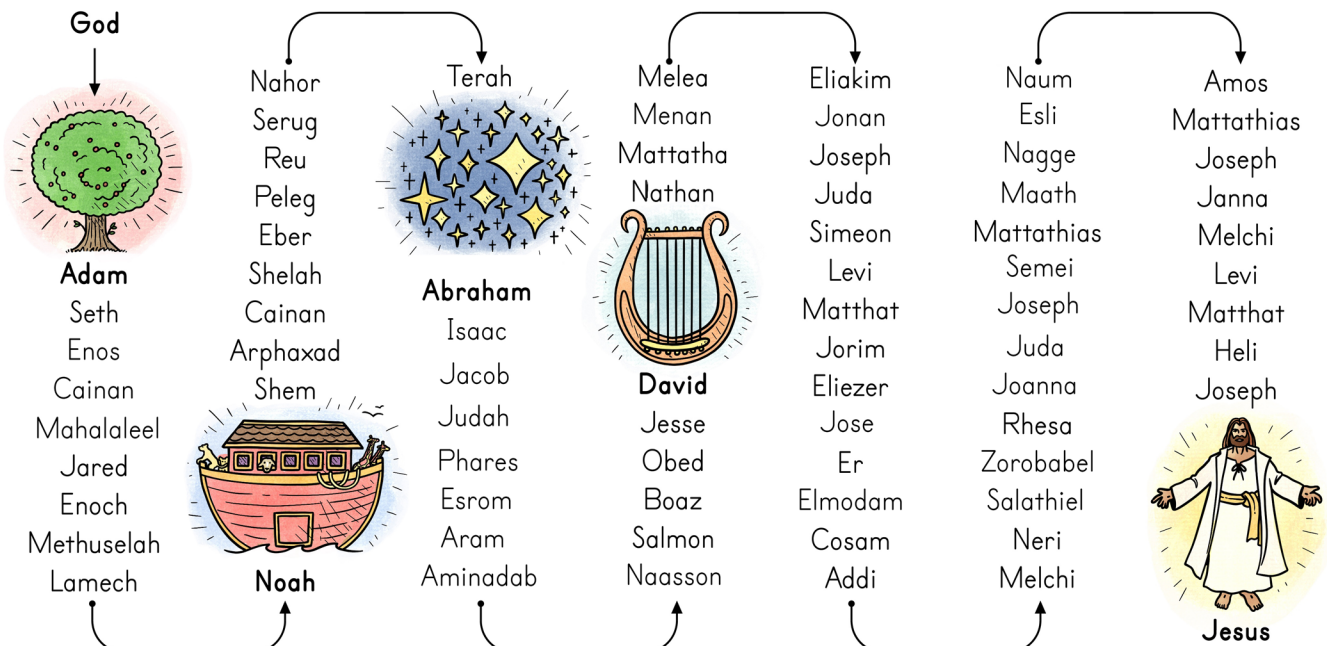
The biblical genealogies are a great example of **written genealogy**. With a rise in literacy came a rise in record-keeping across ancient civilizations. Many cultures

recorded their family trees in poems and histories. Later, during medieval times, the royal families of the British Isles took great pride in recording their family lines in *pedigree charts*. A pedigree chart displays the direct ancestors of a single person over long stretches of time. These charts are still often used in genealogy today!

Modern genealogy utilizes both the oral and written traditions of the past, as well as new, different tools. While professionals can gain educational degrees to properly analyze and compile historical data, you can participate in genealogy right now—from your own house! To start keeping track of your family’s history, you can do a few things: ask around for stories about your ancestors, look through old scrapbooks or journals, or learn more about the country your ancestors originally came from. Genealogy is about family, and the best way to learn more about it is to stay in touch with yours! Ask your parents if they already have a family tree or pedigree chart, and if so, start from there. Generations of stories just might be at your fingertips!

LINEAGE OF JESUS CHRIST

Luke 3:23-38*

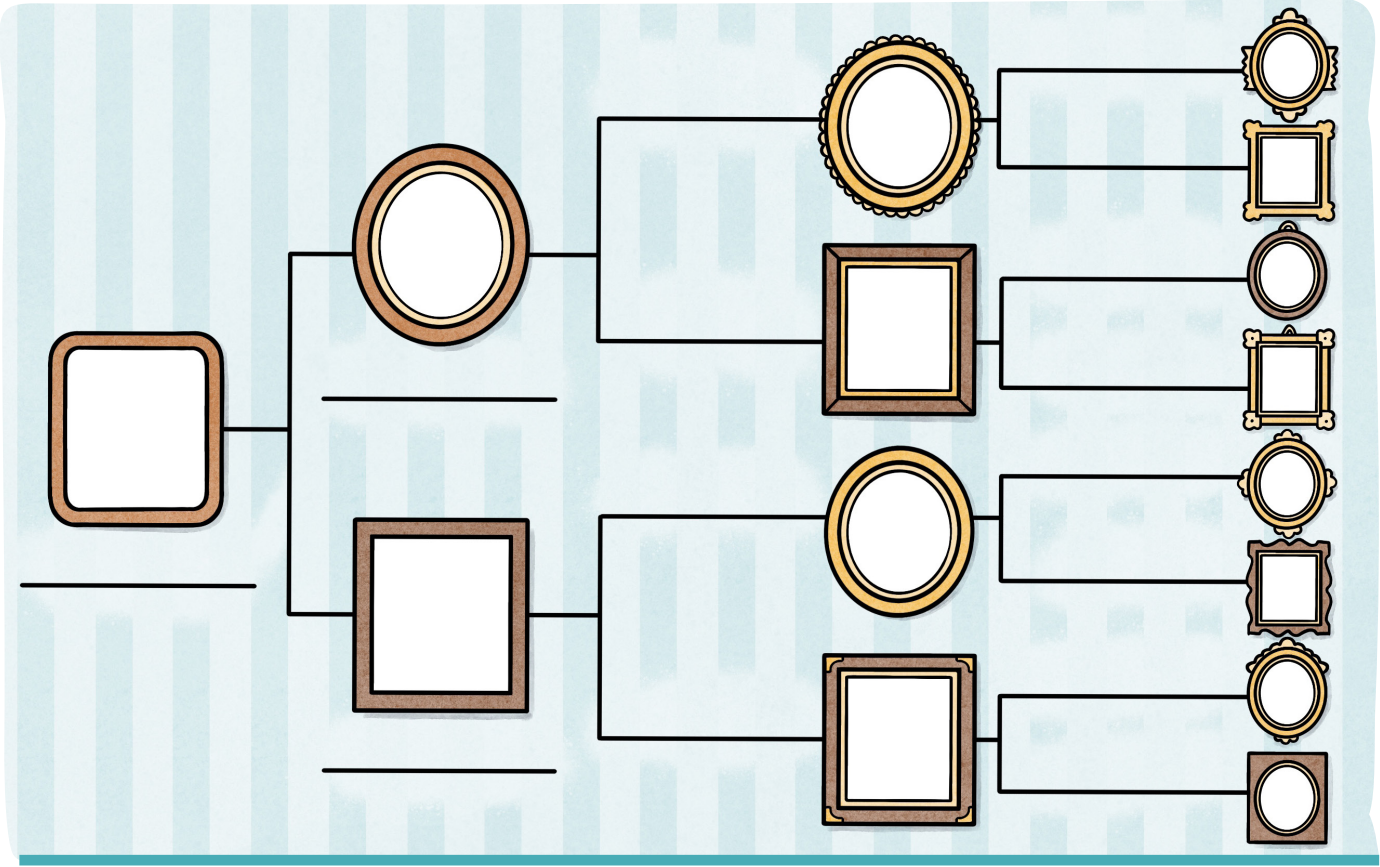


*Some names use the more common or recognizable spellings used elsewhere in the Bible. See Genesis 5, 11, 29; 1 Chronicles 1; Ruth 4; and Matthew 1.

1. Look at the genealogy chart on the previous page, which details Jesus's lineage mentioned in Luke 3. Circle any names that you recognize.

2. How does learning about Jesus's family line tell us more about Him?

3. Use the pedigree chart below to fill in your own family history. Hint: The first frame on the left is you.



TRADE IN EGYPT

LESSON
5

As you listen to the information in the course book, use the key on the bottom of the page to draw the goods in the location they came from.



= wood



= olive oil



= pottery



= gold



= iron



= papyrus



= grain

MARRIAGE IN BIBLICAL TIMES

Read the following and complete the activity at the end of the extension:

While learning about the story of Isaac and Rebekah, you may have noticed some differences about their marriage from the marriages you see today. Think of a married couple you know—an aunt and uncle, a grandmother and grandfather, or your own parents. How did they meet? Chances are, they probably were not introduced by a servant on camelback! But that is exactly how many marriages in biblical times began.



sperm whale tooth

Traditional marriage proposals are a little bit different in every culture. For example, in Fiji, the groom asks permission to marry the bride by presenting her father with the tooth of a sperm whale. Meanwhile, in Ghana, the groom arrives on the bride's doorstep to discuss his intentions with her parents at a traditional "knocking ceremony," involving gifts and wedding planning with both families.

You may have noticed that many decisions regarding marriage and weddings often center around family. It was no different in biblical

times. Just as Abraham arranged for his servant to find Isaac a wife, it was the parents' role to choose a bride for their son. This bride was usually chosen locally from the son's own people. Once a suitable candidate was found, both families would coordinate to arrange a **etrothal**, or formal engagement. Some weddings, such as Isaac and Rebekah's, were organized before the bride and groom even met!

Unlike engagements today, betrothals were a lengthy process. The period between a betrothal and a wedding could last up to a year! During this time both families met and exchanged gifts and money for wedding preparations. Betrothals were also legally binding; once betrothed, the couple were considered publicly married, even before the wedding. A good example of this principle in the scriptures is Mary and Joseph, whose story is written in the book of Luke. When Mary was told she would give birth to Christ, she and Joseph were still in the betrothal period of their engagement. After Joseph was visited by an angel, he acted as a faithful husband until their wedding could take place.

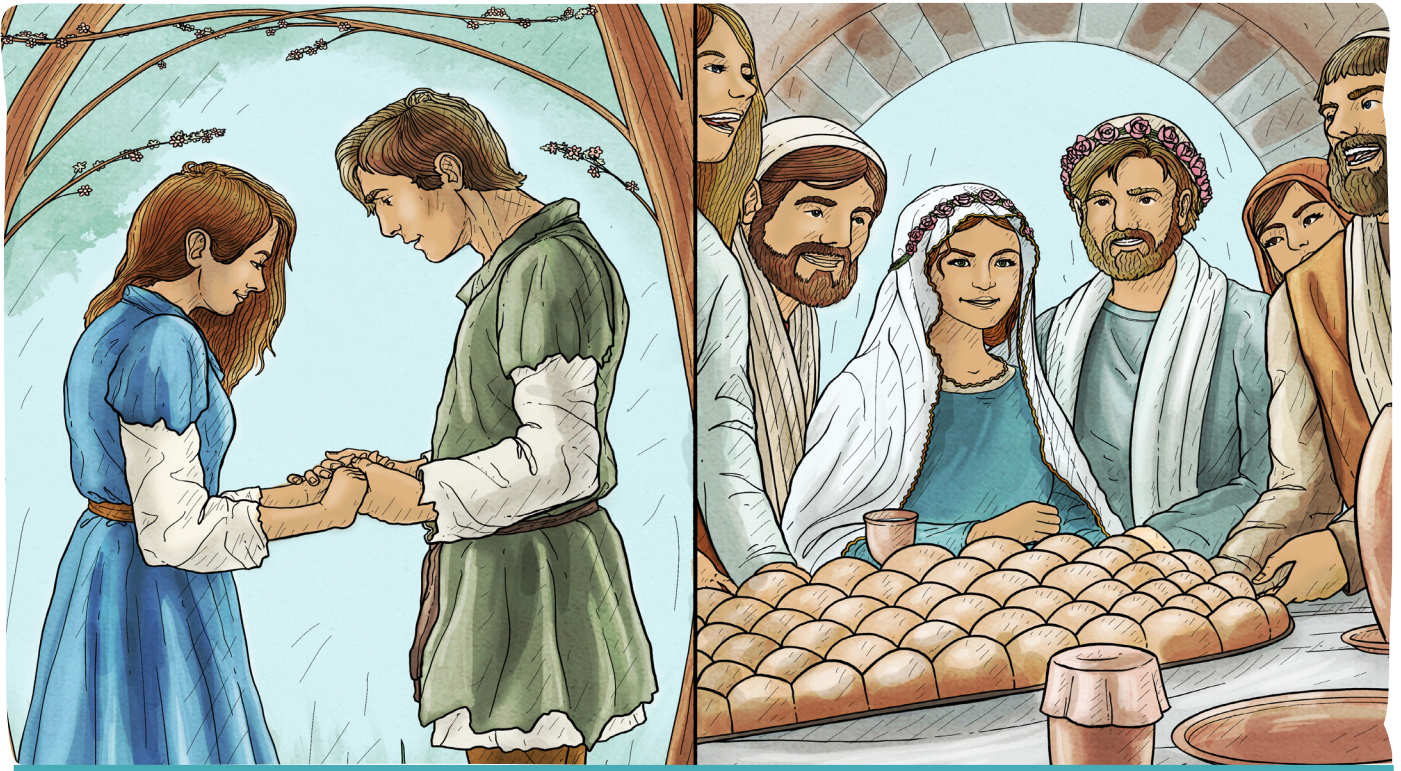




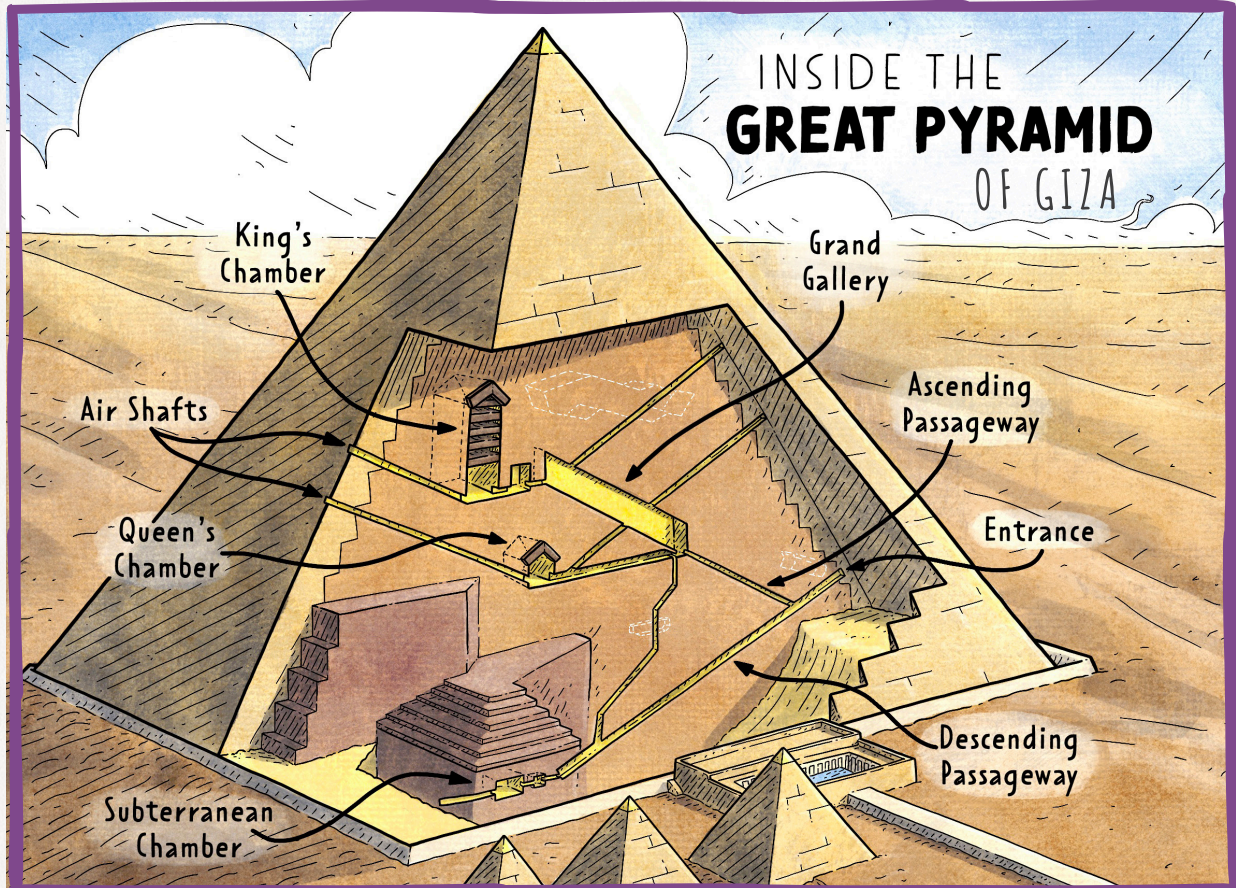
The actual marriage ceremony in biblical times was beautiful and festive, just like weddings today! Both the bride and bridegroom (the name used for the groom in the scriptures) were bathed and dressed in beautiful clothes—the bridegroom wearing a crown of fine metal or flowers, and the bride wearing a veil and jewelry. Together, the couple proceeded to the bridegroom’s home, where they received a special blessing from his parents that drew its wording from the scriptures. The next day was a wedding feast involving everyone in the village, and afterward celebrations would sometimes go on for several more days!

Weddings in the Bible were a time of celebration and love, but they were also driven by a duty and devotion to God. Adam and Eve, the first people, were commanded to multiply and be fruitful, and

marriages often led to large families—many of which we read about in the Bible! Though many traditions have changed and vary from culture to culture, marriage’s divine purpose remains. As we study and learn about the traditions of faithful people long past, we are able to learn from their examples and apply them to our own lives.



As you read each description below, trace the path you would follow if you were visiting each of the described locations in order.



1. Entrance

The Great Pyramid of Giza once had a heavy swivel door at the entrance and could easily be pushed open from the inside. On the outside it was very hard to find because it fit perfectly.

2. Descending Passageway

This passageway leads to the subterranean chamber near the bottom of the pyramid.

3. Subterranean Chamber

Many archaeologists believe that this was intended to be the original burial place for Khufu, but this chamber was never finished. It is thought that the king changed his mind and wanted to be buried higher up, in the King's Chamber.

4. Ascending Passageway

This passageway leads up toward the Queen's Chamber and the massive hallway called the Grand Gallery that leads to the King's Chamber.

5. Queen's Chamber

Despite its name, the Queen's Chamber is not where the queen was buried, as Khufu's queen, Hetepheres [he-te-FARE-eez], was found buried in a separate tomb east of the pyramid. Rather, it is believed that this was originally meant to be the King's Chamber, before a larger one was constructed higher up.

6. Grand Gallery

This hallway is very tall and narrow. Scholars have suggested that pulleys and counterweights may have been placed here to lift stones to the upper levels of the pyramid.

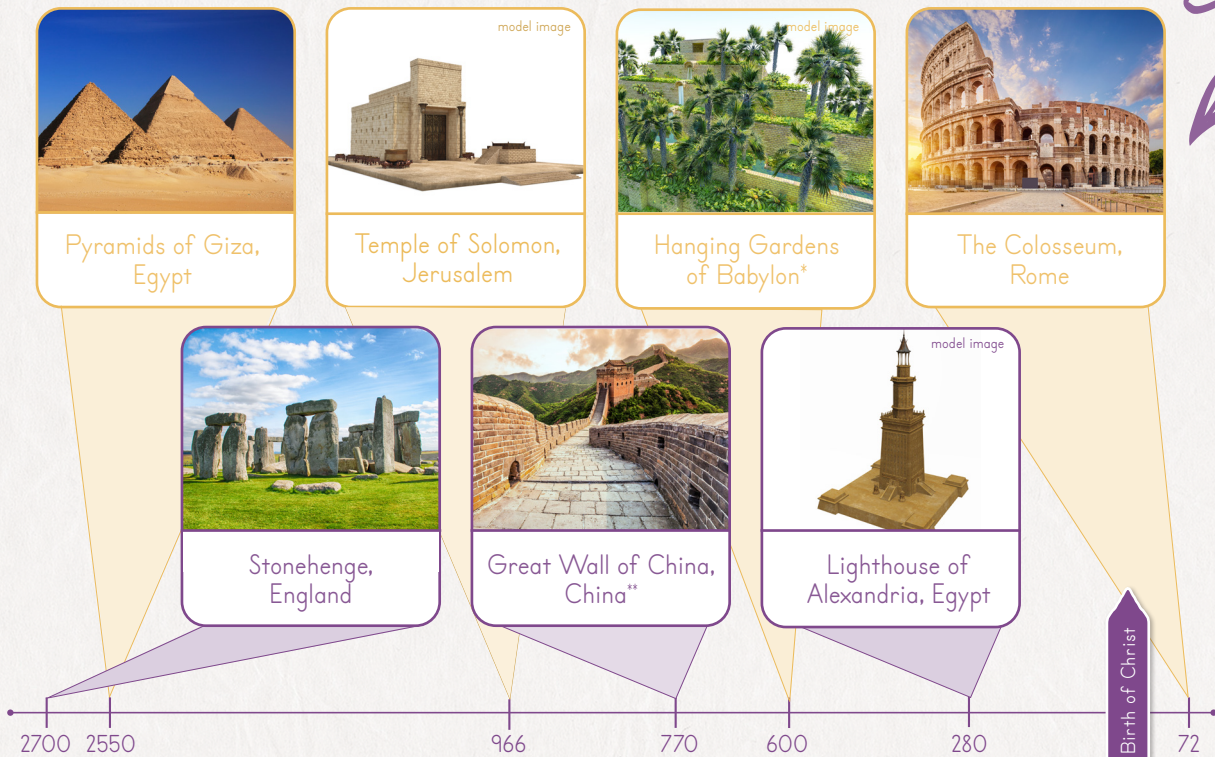
7. King's Chamber

When archaeologists reached the King's Chamber, they found an empty red sarcophagus and little else. Some believe that the original contents, including the king's body, were stolen by thieves.

8. Air Shafts

The air shafts helped to bring fresh air to the inside of the pyramid.

Incredible structures that were built with special talent and skill are sometimes given the title "Wonders of the World." Of the many structures that have been given this label by various people through the centuries, the Pyramids of Giza are one of only a few ancient wonders still remaining. Some others are Stonehenge, the Colosseum, and the Great Wall of China. Look at the time line below that shows these and other amazing structures built before and around the birth of Jesus Christ, and then answer the questions at the bottom of the page.



*While Babylon is the most well-known location for the Hanging Gardens, scholars are still divided on where they were truly located, or even whether they existed at all.

**The Great Wall of China began as scattered earthen structures in the 700s BC and was slowly improved and connected over almost 2,000 years. The majority of what remains today (pictured above) was built between AD 1368 and AD 1644.

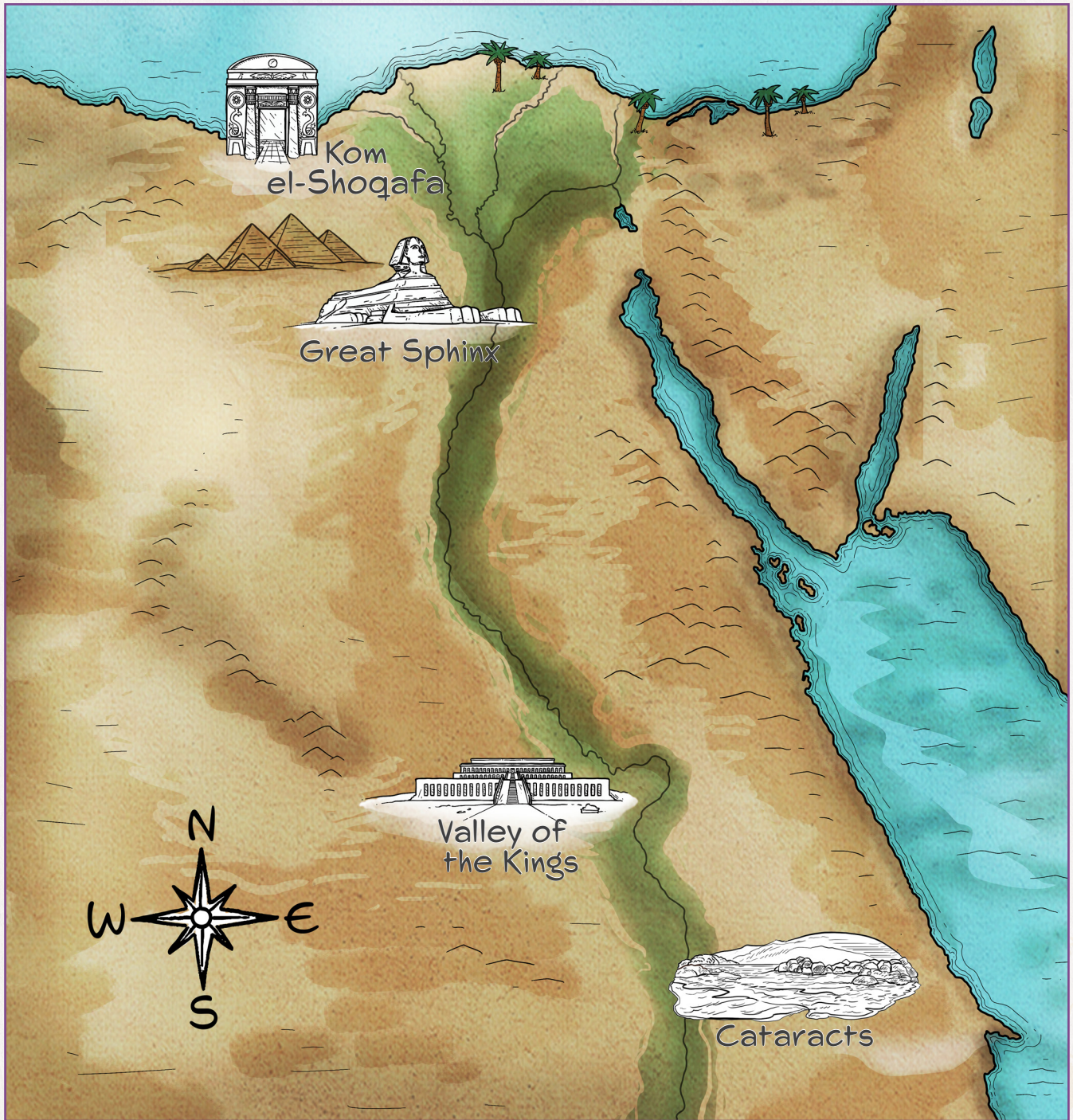
≡§ QUESTIONS §≡

1. Which other structure was created about the same time as the Pyramids of Giza?
2. Which two Wonders of the World were built in Egypt?
3. Which structure was built closest to the time of Christ?

⌘ NILE RIVER ⌘

LESSON
13

Follow the instructions in the course book to color the missing parts of this map.



ANCIENT EGYPTIAN ARCHITECTS

Read the following and complete the activity at the end of the extension:

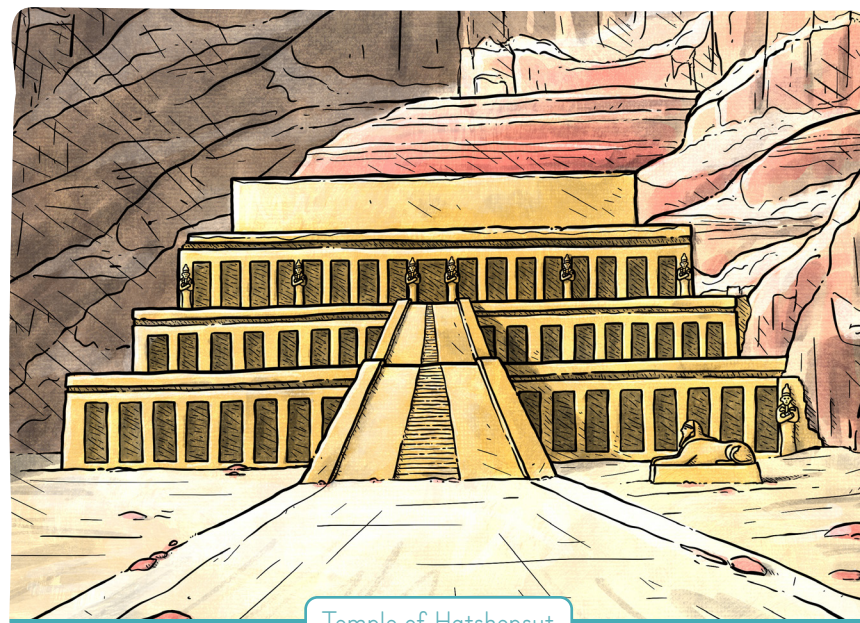
Architecture, or the practice of designing and building structures, is a huge part of Egypt's history. Massive stone temples and pyramids still stand today and are still being admired by archaeologists and tourists alike. But in all the admiration for these vast creations, we often forget about who could have designed them or taken part in their construction. Today, let us take a look at three ancient Egyptian architects and their creations.

Imhotep [EE-mow-tep] was a noble on the pharaoh Djoser's [JOE-sir's] court. Though he was trained as a scribe, he rose to gain many important titles, such as chief vizier [vih-ZEER] and physician to the pharaoh. Imhotep advised Djoser on many decisions involving government, medicine, and of course, architecture. Did you know Imhotep is the first named architect in the known recorded history of the world? His most important project was designing the Step Pyramid of Djoser, now known as the oldest Egyptian stone monument still standing and the first pyramid built for the kings of Egypt.



Step Pyramid of Djoser

The step pyramid had six tiers, or levels, making it look like a triangular staircase. Though the exterior now appears weathered and dusty, it was originally built with a shining outer layer of limestone on top



Temple of Hatshepsut

of carefully crafted layers of clay. Statues of the Egyptian gods, the royal family, and Djoser himself were supposedly stored inside and beneath the structure. Imhotep himself was a sculptor—perhaps some of his pieces were displayed inside the pyramid too!

Around 1,000 years after Imhotep, the steward Senenmut [SEH-neh-moot] grew very close to the royal family. He served as both an advisor to Pharaoh Hatshepsut [HOT-ship-soot] and tutor to her daughter, Princess Neferure [NEH-fuh-roo-ray]. One of Senenmut's most significant roles, however, was architect of Hatshepsut's mortuary temple. Other

pharaohs you have learned about wanted to be remembered even after death, and Hatshepsut was no different. She ordered Senenmut to design a grand and elegant building to house her tomb.

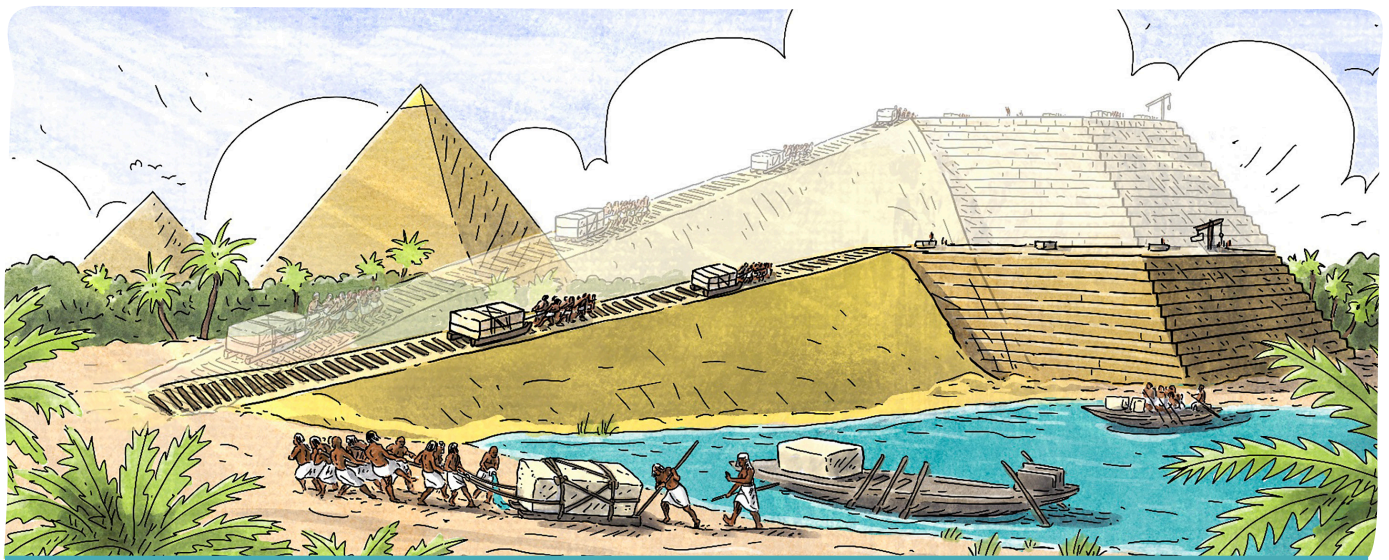
Senenmut, taking inspiration from past pharaohs and their own burial temples, created a complex filled with beautiful gardens and massive statues—a temple fit for a pharaoh. It contained a tomb for Senenmut, while Hatshepsut's burial chamber was actually constructed outside the complex. Historians believe the intent was to dig a tunnel to connect them, but this was never done. Other sections of the temple were built to tell stories about Hatshepsut's life and triumphs as a ruler. The temple still stands today in Luxor, Egypt, carved into the sandstone and spanning a width of nearly 270 meters (900 feet)!



Great Pyramid at Giza

Unlike the previous two architects, Hemiunu [he-mi-OOH-noo] was born of royal blood. He was the son of an Egyptian prince and princess, and nephew of the pharaoh Khufu [KOO-foo]. Perhaps because of this, he served as one of Khufu's highest officials, taking part in many executive decisions regarding the kingdom. Though historians are not sure exactly who was involved, it is widely believed that he was an architect of the Great Pyramid at Giza.

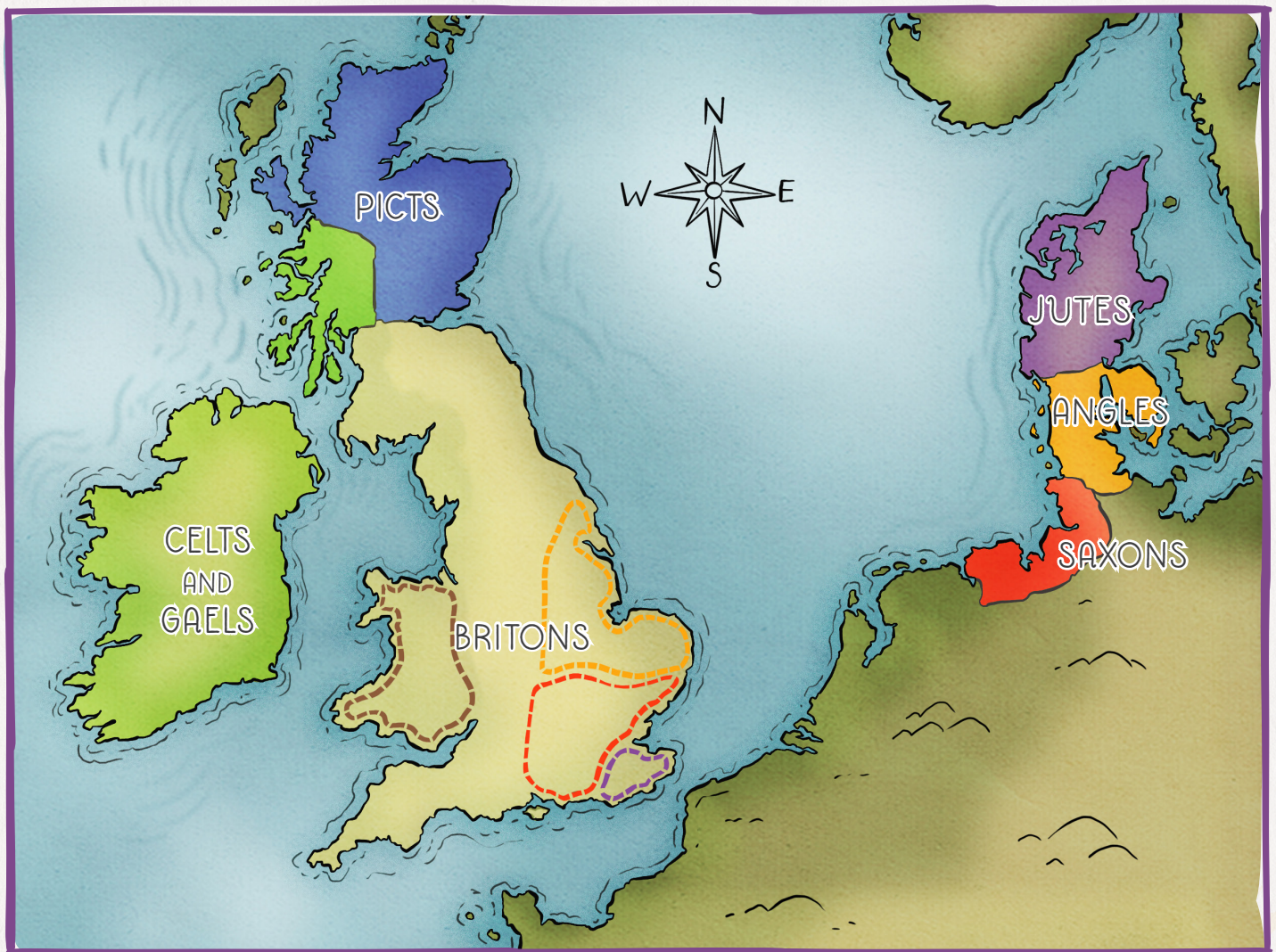
To make sense of Hemiunu's relationship to the pyramid, archaeologists have looked at his burial place, a type of ancient Egyptian tomb called a *mastaba* [MA-sta-bah]. Unfortunately, much of the tomb was looted and destroyed by grave robbers, leaving little behind to study. There are still inscriptions in the mastaba, however, that describe Hemiunu's roles as vizier, prince, and chief architect of the pharaoh. Though much surrounding the pyramid's construction and creators is still a mystery, Hemiunu's role as Khufu's architect means he was more likely involved with the building of Khufu's pyramid than not.



BRITISH MIGRATION

LESSON
16

Follow the instructions in the course book to explore this map.
(Hint: When you need to draw where different groups settled, use the colors of the dashed lines to help you figure it out.)



WEST IRELAND BEEHIVE HUTS

Read the following and complete the activity at the end of the extension:



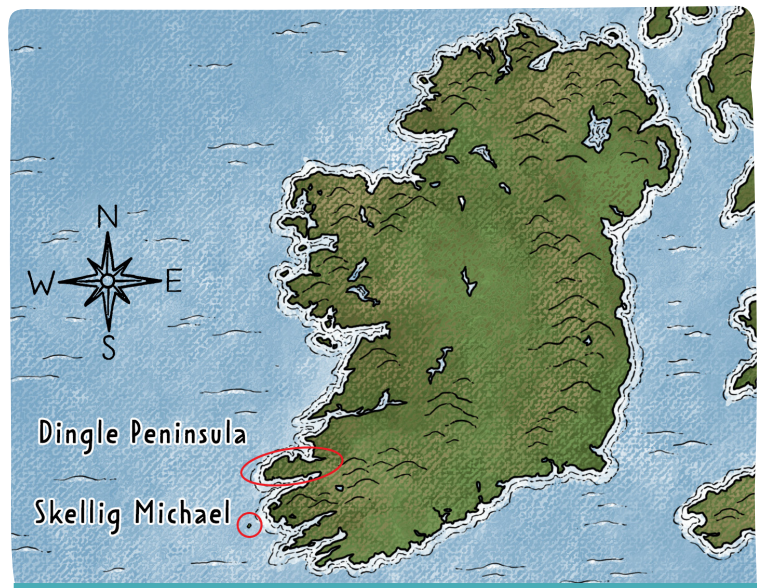
How do you feel about alone time? Is it valuable? Imagine you were given the opportunity to move to a tiny, remote island, where you would spend your days almost entirely alone, praying, studying, and learning God's word. Would you take it?

As Christianity spread into new lands and thousands of believers adopted the faith, many new Christians wished to dedicate their lives to serving God. Esteemed leaders like Saint Benedict wrote essays encouraging devotion to a simple life of service away from family and friends, such as in a *monastery*.

The word "monastery" has the prefix *mon-*, which comes from the Greek prefix *mono-*, meaning single or alone. A monastery was a place where men, known as monks, lived mostly solitary lives dedicated to studying and writing God's word. (Women who did this were called nuns.) Monasteries typically consisted of a cluster of buildings including a chapel, simple sleeping rooms, gardens,

and workrooms where the monks could read and write scripture or spend time in prayer and meditation. The monks also worked the land and built the community's structures themselves using local materials for construction. Monasteries often provided a stopping-off point or ministry station for missionaries. They also became a collection site for records within a local area. There were no printing presses, so handwritten copies were the only way to distribute any type of literature, scripture or otherwise. The ancient Irish did not keep written records. Only through the histories, tales, and other texts the monks inscribed are the civilizations of most of western Europe preserved.

As Saint Patrick shared the gospel with the people of Ireland, he believed he was reaching a group of people who were at the outermost point of civilization. This was before any great sailing expeditions had proved otherwise, so many people in Europe believed the earth was flat. They assumed Ireland was at the edge of the earth. Forming missions in various points around Ireland was critical to promoting the spread of the gospel, and a couple of very important locations were on the Dingle Peninsula and an island off of its west shoreline called Skellig Michael.





Stone was plentiful along this western coastline, and the monks who constructed the monastic buildings used a regional technique that dated back a couple of centuries. The buildings were called *clocháns* [CLUH-hons], and they were shaped like beehives. Instead of using mortar to fix the stones together, stones were laid thickly in layers on top of each other, with each rising layer having a slightly smaller perimeter. As the layers of stone reached the top and narrowest point, or *apex*, a single stone was used to cover the opening. Although the stones were not sealed with any type of cement, they were laid so carefully that raindrops did not penetrate through the walls or ceiling.

These buildings were reportedly used by the monks on Skellig Michael until they had to evacuate the island in the 13th century due to extreme weather. The fact that the primary portion of these buildings is still intact in spite of the harsh coastal conditions is a testimony to the efficient architectural design. It is amazing to think about people living alone within these stone huts at the edge of the known earth, praying and copying manuscripts for the spread of the gospel. The dedicated members of these *clochán* communities on the west coast of Ireland were continuing the work of Saint Patrick and the many missionaries who came after him. They believed the words of Acts 13:47: "For so hath the Lord commanded us, saying, I have set thee to be a light of the Gentiles, that thou shouldst be for salvation unto the ends of the earth."



In this extension you learned that without the monks in Ireland painstakingly copying down their histories, scripture, and tales, we would have no written record of the Irish from long ago. Your personal history is important as well! You might think daily details such as what you ate for breakfast or how much items cost are not important, but in 50 years, these details will be very interesting for you and your posterity to read! Answer the questions below to help preserve your own unique story.

When and where were you born?

What is an interesting fact about you or your family?

How much does your family spend on a common item like milk? Write as many prices and items as you would like.

What is a fun trip or experience you have had with your family?

What is something you would want your future children, grandchildren, or great-grandchildren to know?

Bonus: Keep a journal for at least one week.

STORY OF RIGHTS

Freedom and equal rights have not always been protected. Throughout history people have had to fight for the right to be treated equally and fairly, and the battle continues today. As you or your parent reads the information below, trace your finger along the time line to see just a few examples of how people around the world have fought for their rights. Stop at any date with an asterisk (*) next to it and find it in your *History Time Line Book*. When you reach the end, draw or write two ideas of your own about how you can help protect your own and other people's rights today.

1215*
When the unjust English king John pushed his people too far, they forced him to sign a document called the Magna Carta, which said the king must follow laws too. This helped protect the rights of the people.

1620*
When England would not allow people to practice their religion, many groups sailed away to North America to have religious freedom.

1791
After nearly 300 years of slavery under Spanish and French rule, the people of Haiti rebelled and eventually won their freedom.

1913
When women were not allowed to vote in the United States, over 5,000 women marched in a parade in 1913 to make their voices heard and gained the right to vote in 1920.

1920*
When they worried about unfair treatment of children, people gathered in Geneva, Switzerland, and made a document called "Geneva Declaration of the Rights of the Child."

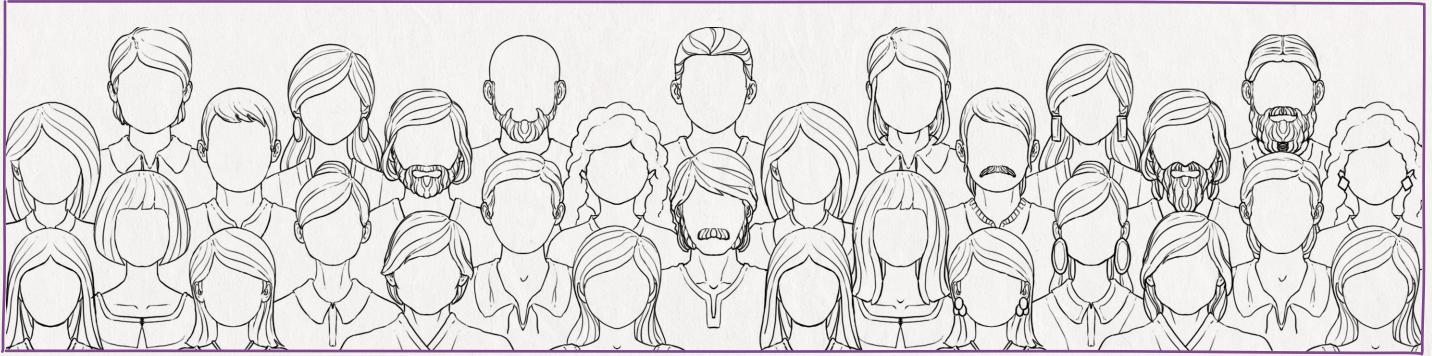
1924

1963*
When Black people in the US were treated unfairly, Martin Luther King Jr. spoke about a future when skin color would not matter and everyone could be kind to each other. (Find US Civil Rights Movement from 1954 to 1968 on the time line.)

BLACK DEATH ROLL

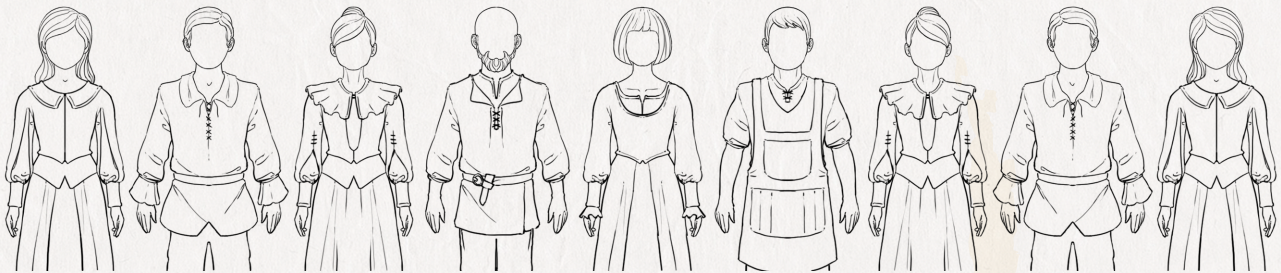
LESSON
26

In the lesson you learned that at least a third of people in Europe died from the plague. Let us take a closer glance at what that might have looked like. Color one-third of the characters below red. This represents the part of the population that would have died.



The people throughout the city had a one-in-three chance of dying, but that does not mean it would have been exactly one-third as shown above. Let us simulate what this might have looked like with the nine drawings of people below. Pick one person below by circling them. We are going to see if the character you pick would have survived the Black Death. Roll the dice for each character. If you roll a one or two, the person dies of the disease. Color them red. If you roll any other number, the person survives, and you can leave them uncolored.

This is called probability. You might end up with no deaths at all, but the probability predicts that three out of nine (or one-third) will die.



- How many of your characters died? Was it more or less than one-third?
- Did your character survive?
- If desired, repeat the simulation multiple times and see what happens. Rolling dice to determine probability is random, and losing a loved one to the Black Death must have felt frighteningly random to the people of the time as well. They did not know who would or would not survive. Today, we know that death came to those who were exposed to the bacteria causing the disease and whose bodies could not fight it off.

THE STORY OF THE SISTINE CHAPEL

Read the following and complete the activity at the end of the extension:

Our story begins in the smallest country in the world: Vatican City, located inside the city of Rome. You make your way through a museum with a crowd of other foreigners, trying to identify the many languages being spoken around you. Anticipation grows as you proceed through the hallways, admiring the amazing sculptures, paintings, and historic artifacts on display. When you finally see the sign “Cappella Sistina,” you notice the atmosphere change as guards and posted signs inform visitors to put away any cameras or smartphones, and a hushed silence falls. The time has finally come! You step into the massive, rectangular, high-ceilinged room and are immediately overwhelmed by the beauty all around you. From the intricate mosaic tiled floors to the vibrantly painted walls and ceiling, the Sistine Chapel stands as a marvel of the Renaissance. Let us take a look at how this incredible place came to be.

The Sistine Chapel is located in Vatican City, home of the pope, leader of the Roman Catholic Church. The chapel was built in 1473–1481 by the architect Giovanni dei Dolci and named after Pope Sixtus IV, who had it built and commissioned the frescoes on the walls within. To create a fresco painting, an artist paints directly onto wet plaster. The paint dries along with the plaster and becomes a part of the wall itself. Well-known Renaissance artists such as Sandro Botticelli [SAND-row BOT-i-CHELL-ee], Pietro Perugino [PYEH-tro peh-roo-JEE-no], and Domenico Ghirlandaio [daw-MEN-ee-koh geer-lan-DIE-yoh] created the massive frescoes on the walls of the Sistine Chapel depicting scenes from the lives of Moses and Jesus. The ceiling was originally a giant fresco painting of the night sky, a blue background with stars.

However, years later, when a crack damaged the ceiling, Pope Julius II sought out an artist he was already acquainted with to repaint the ceiling, Michelangelo Buonarroti [mike-ell-ANJ-ell-oh BWEH-no-ROT-ee]. Pope Julius II had hired Michelangelo previously to create and adorn his own tomb. The two had several disagreements during that project, leaving Michelangelo hesitant to work together again. When Michelangelo finally accepted the commission to paint the ceiling of the Sistine Chapel in 1508, he convinced the pope to change plans from a simple painting of the 12 apostles to the highly ambitious masterpiece you can see today. At the time Michelangelo was a famous sculptor but had never used the fresco painting technique before.

In order to reach the incredibly high ceilings, Michelangelo created a special bridge-like scaffolding. You may have heard that Michelangelo painted while lying down, but he actually stood on the scaffolding,



Sistine Chapel, Vatican City

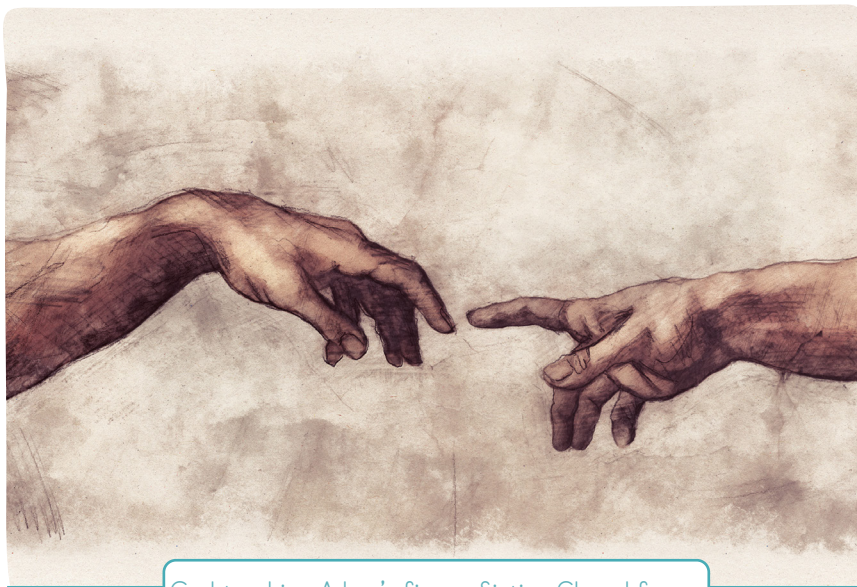
craning his neck upward and reaching up to the ceiling above him. Four years of that must have been very uncomfortable! Michelangelo began painting at the entrance to the chapel and made his way to the other end of the room above the altar. He did not allow anyone, including the pope himself, to view his progress as he went. He mapped out the scenes in a specific order and pattern.

Along the outer rim of the ceiling, Michelangelo alternated between seven prophets and five sibyls, or female prophets, who foretold the coming of Jesus Christ. Also around the edges, you can see depictions of 40 generations of the ancestors of Jesus. In the four corners are additional scenes from the Old Testament highlighting the Salvation of Israel. The center strip of ceiling has a total of nine panels depicting scenes taken from the biblical book of Genesis. As you walk into the chapel, you see the scenes in reverse chronological order, starting with three scenes of Noah, then three depicting Adam and Eve, and the final three showing Creation. You have likely seen a reproduction of the panel that has been called *The Creation of Adam*. It has been used on posters, T-shirts, bumper stickers, and much more. God, portrayed as an older, muscular, gray-bearded man, is shown reaching out to touch the outstretched finger of Adam.

Twenty years after completing the Sistine Chapel ceiling, Michelangelo returned to repaint the entire wall behind the altar. The fresco, *The Last Judgment*, was commissioned by Pope Clement VII and was completed in 1541 under Pope Paul III. Many consider it to be Michelangelo's greatest masterpiece.



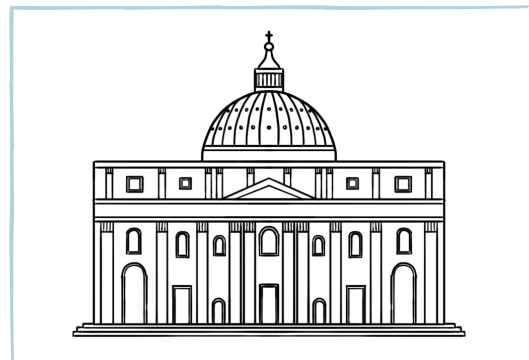
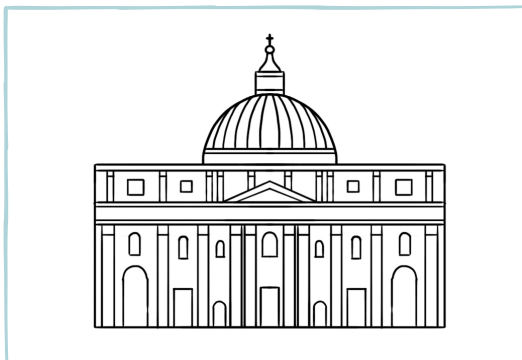
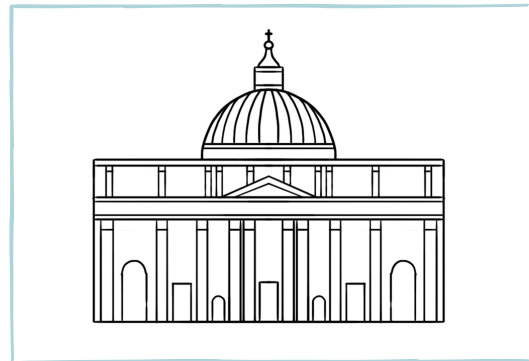
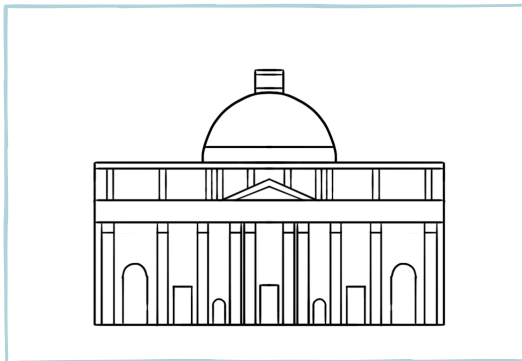
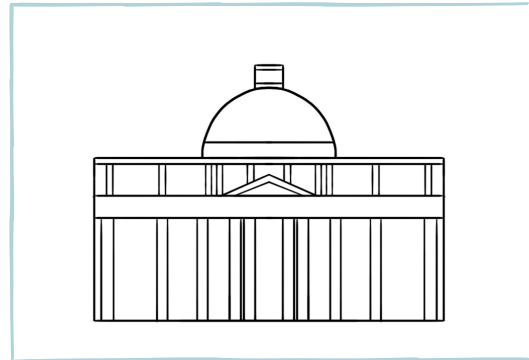
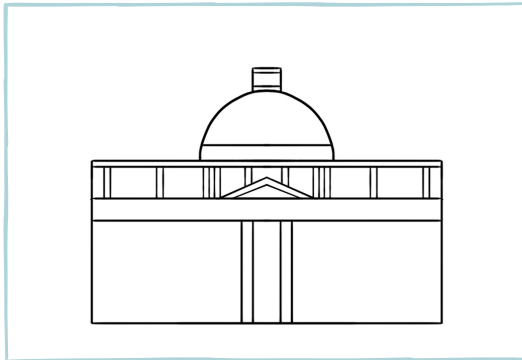
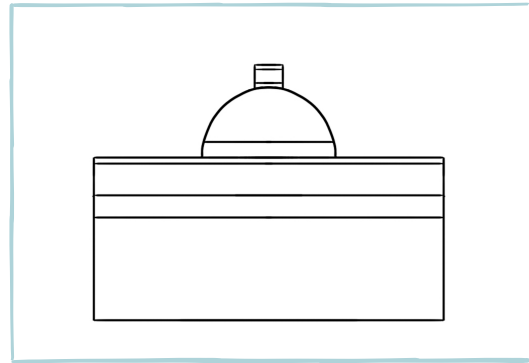
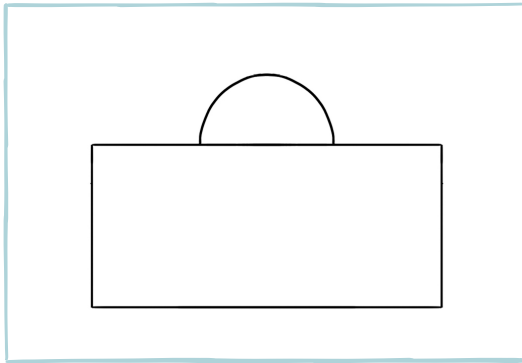
the Delphic Sybil, Sistine Chapel fresco



God touching Adam's finger, Sistine Chapel fresco

The Sistine Chapel has been and continues to be used for ceremonies, baptisms, and perhaps most notably, as the meeting place for the papal conclave. The papal conclave consists of a group of senior clergy members of the Catholic Church who meet together, when needed, to elect the next pope. When white smoke is seen coming from a pipe through the roof of the Sistine Chapel, it signals to the world that a new pope has been elected. The Sistine Chapel is precious not only to followers of Catholicism. Millions of people have visited the Sistine Chapel, marveling at the splendor of the Renaissance art preserved there for over 500 years.

As you learned in the article, Michelangelo painted the ceiling of the Sistine Chapel while standing on a scaffold with his head craned back. To appreciate just how difficult this would be, complete an art project in a similar fashion. Tape a piece of paper to the underside of a kitchen counter or table. Then sit down and look up to sketch and/or paint the art project of the outside of the Sistine Chapel that is detailed below.



SURVEYOR GEORGE WASHINGTON

Read the following and complete the activity at the end of the extension:

Would you be surprised to learn that an old textbook full of math problems is interesting to historians studying George Washington's life? The Washington Library at Mount Vernon owns a book called *The Compleat Surveyor* that Washington studied when he was a teenager, and we can learn a lot about Washington by looking at this book. Washington borrowed the book from a neighbor when he was about 13 years old and taught himself the profession of surveying by studying it. His skills as a surveyor influenced the rest of his life.

Surveying is a way to make accurate measurements of the surface of the earth. Surveyors measure areas of land and determine the location and size of natural features. Once they have obtained accurate measurements and positions, they create maps from the data they have collected. Surveying is necessary to determine where boundaries exist, and the information is used to determine land ownership and where to best build roads, bridges, and buildings. In the American colonies, these skills were highly valued, and a career as a surveyor was both respectable and lucrative.



George Washington's father died when he was 11 years old, denying George some of the educational opportunities his older half-brothers had received. As a younger son, George would inherit only a small portion of his father's property, so he needed to prepare himself for a different future. His formal education ended with his father's death, but young George valued education and reading, and he studied diligently on his own. *The Compleat Surveyor* explains how the geometrical theorems developed by the ancient Greeks can be used to survey land. It begins with simple problems, using a ruler and a compass to create parallel and perpendicular lines, and then presents more difficult problems using geometry and trigonometry. Some of the notebooks young George used to solve these problems show that he mastered at least 17 of the problems in the book.

The Compleat Surveyor also taught the skills necessary to handle various situations one might encounter when measuring actual land. Surveyors need to divide irregularly shaped pieces of land into

T H E

Compleat Surveyor :
Or, the WHOLE ART of
S U R V E Y I N G
O F
L A N D,
B Y
A New INSTRUMENT lately invented ;
As also by the
Plain Table, Circumferentor, the Theodolite
as now improv'd, or by the Chain only.
CONTAINING
Plain and Easy DIRECTIONS in several Kinds of MENSURATIONS, and
Other Things necessary to be known in a Work of this Nature.

By WILLIAM LETBOURN.

The WHOLE Altered and Amended, and Two entire BOOKS added
by the AUTHOR long before his DEATH.

The FIFTH EDITION, in IX BOOKS.

Every Operation both Geometrical & Arithmetical being examin'd,
AND AN
A P P E N D I X
Added to the WHOLE, Consisting of
Practical Observations in Land Surveying,
By SAMUEL CUNN.

L O N D O N :
Printed for SAMUEL BALLARD at the Blue Ball, and AARON WARD
at the King's Arms in Little Britain, and THO. WOODWARD at the
Half-Moon against St. Dunstan's Church in Fleetstreet. 1722.

accurately sized plots. Often they need to measure large distances or work in difficult terrain, like marshes or forests, and of course, land is rarely flat, so they need to learn how to work in hilly or mountainous areas. The book also explained how to represent bodies of water and use color to enhance maps. Learning to survey taught Washington the importance of accuracy and precision and gave him problem-solving skills that he would use throughout his life.

One of Washington's first efforts was making a survey of his half-brother Lawrence's turnip fields. Later, when he was 16, Washington accompanied his friend George William Fairfax on a monthlong expedition to western Virginia, where they surveyed land and laid out lots. This trip gave Washington valuable experience, both in surveying and in living on the frontier. A year later 17-year-old Washington was appointed to a job as county surveyor of Culpeper County, Virginia, which paid well. Two days after his appointment, he completed his first survey. Washington only held this position for about a year, but he continued to work professionally as a surveyor for two more years, and he had completed over 200 surveys by the time he began a new career in the military in 1753 at the age of 21.

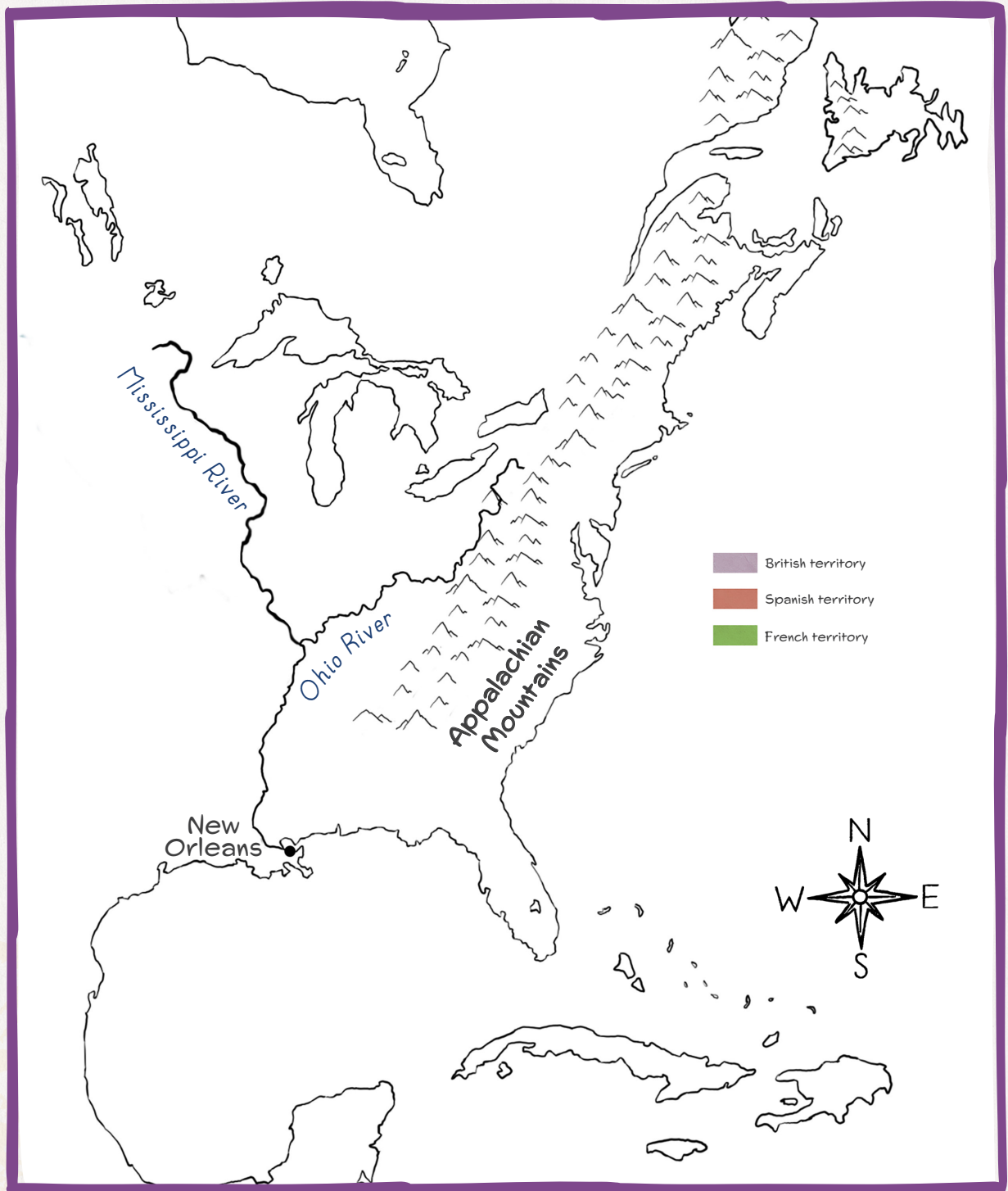
Although George Washington never again used his surveying skills professionally, he continued to make surveys throughout his life. He made maps during the Revolutionary War, and his understanding of landscapes helped him with battle strategy and moving troops across different types of terrain. After his military career, he continued to use surveying to manage his vast properties. At one point he owned 70,000 acres of land, and he needed to establish boundaries and divide it into *tracts* (sections). He also put his skills to use when he acquired new land. Surveying was such an important part of Washington's life that he completed his last survey only a few weeks before he died.



"George Washington, surveyor" by Henry Hintermeister (1897–1970), 1948

FRENCH AND INDIAN WAR

Follow the instructions in the course book to add details to the map below.



⌘ PATRIOT OR LOYALIST ⌘

During the revolution not all members of a family shared the same opinions. We are going to role-play a family dinner of mixed Patriots and Loyalists, but first you have to find out which side you are on. For each pair of opinions below, read both opinions, and then flip a coin. If you get a heads, check the box next to the Patriot opinion. If you get a tails, check the box next to the Loyalist opinion. Whichever side has more checked boxes will be the side you get to portray for the next part of the activity. Do not tell your family members your results.

PATRIOT

- You feel like the colonies are no longer part of Britain and want to break away from Britain.
- You do not have a lot of money and feel like these taxes are too high. You are strongly opposed to taxation without representation.
- You want to join the Continental Army and help create your vision of an independent country.
- You are inspired by newly formed societal ideas of freedom and pursuits of happiness. Staying with Britain will not bring change.
- You believe that Britain has too much power and that the people in the colonies should be able to elect their own representatives.

or

LOYALIST

- You are deeply loyal to your home country and would never want to break away from Britain.
- You have strong ties to Britain in your business, and staying connected to it is beneficial. The taxes are not important.
- You fear the chaos that might come from forming an army. It sounds like a foolish and dangerous pursuit.
- You believe in trying to make things work and believe that negotiation with Britain will eventually bring peace.
- You believe that Britain offers stability and order. The colonies are a safer and more orderly place because of Britain's leadership.

or

or

or

or

All of the opinions you checked are ones that real, well-intentioned people probably held at the time. Many people agreed with opinions from both sides of the argument but chose to lean one way or the other. Act out the following scenario. Pretend you and your family are sitting down to dinner. It has been a while since you have been together, and you are not sure which side each family member is on. Ask each other questions to find out how others feel about the topics above, and try to figure out where everyone stands without directly asking if they are Patriots or Loyalists. Remember to be calm and kind while you talk. After discussing for a while, see if you can correctly guess each family member's position. Then discuss what you learned from this activity.

AN "ESSAY IN ARCHITECTURE"

Read the following and complete the activity at the end of the extension:

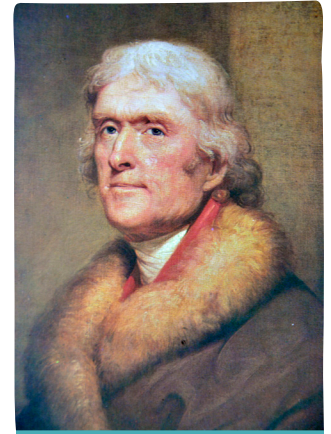
Thomas Jefferson was a man of many talents and hobbies. Though he was widely known for his contributions to local and national government and his eventual role as third president of the United States, these titles did not even scratch the surface of all Jefferson accomplished during his life. One of his lesser known but undoubtedly influential interests was architecture. After inheriting a large stretch of property from his father, a young Jefferson began drawing up plans for the construction of a beautiful home.

The goal was not only to build a place to live, but to build a place that would revolutionize architecture in the area. Jefferson thought the buildings in the colonies were too British, calling them "rude, mis-shapen piles, which, but that they have roofs, would be taken for brick-kilns." He designed his home to be much grander, drawing inspiration from classic Italian architecture and plotting it on top of a tall hill. This was likely the inspiration for the structure's eventual name: Monticello, or "little mountain."

By the time Jefferson left the country for his ambassadorship, Monticello was nearly completely finished—or so he thought. While in France he had the opportunity to see many different kinds of architecture, which struck him with inspiration for several additions and adjustments to the home. After returning to America, he presented new blueprints for the changes and began work in 1796.



The building was unlike any other in the area, with a domed roof, skylights, and a Pantheon-like row of columns marking the entrance. His love for the places he visited, especially France, shone through in its architecture. Jefferson considered Monticello his own artistry, an "essay in architecture," and he



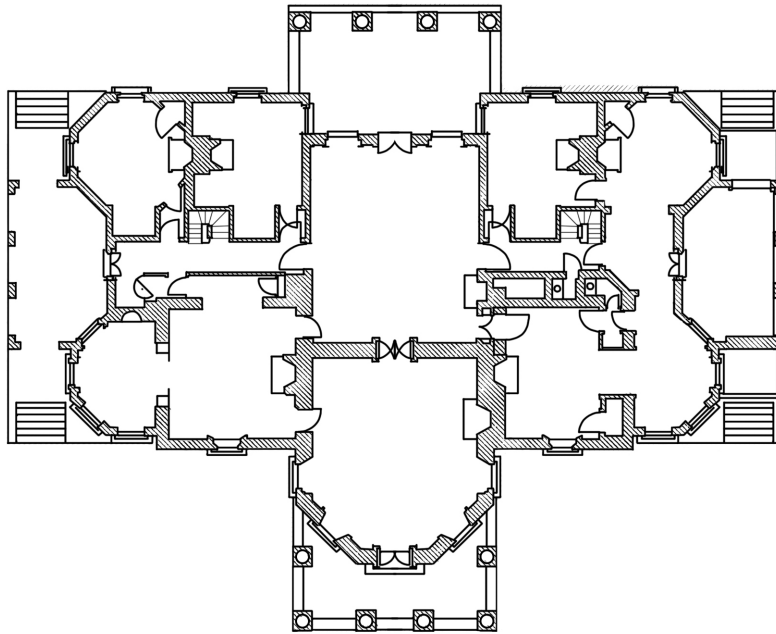
would spend nearly all his life working on it. The basement level was finally finished in 1809, marking the completion of a home undoubtedly unique to its owner. Inside were endless devices, some of which were invented by Jefferson himself. With everything from a two-faced clock, readable from inside or outside the home, to a dial that forecast the weather, Jefferson's home was just as versatile as himself.

After Jefferson's death Monticello passed through multiple owners. His grandson, unable to repay the debts its construction left behind, was forced to put the home up for sale. The property eventually came to one Uriah Phillips Levy, both an officer in the US Navy and a Jefferson enthusiast, who kept the house in top shape and allowed visitors to tour it. The Levy family lost Monticello briefly during the Civil War for supporting the North but was able to regain it once the war was over. Sadly, Levy's heirs could not agree on who should inherit the property, and during their fighting to possess it, Monticello fell into disrepair.

Eventually, through the consecutive efforts of Jefferson Monroe Levy and the Thomas Jefferson Memorial Foundation, Monticello was restored. It is now a national heritage site, looked after and kept up by those wishing to preserve Jefferson's vision. Anyone today can visit and tour the home of a man who wished to reinvent American architecture.

Create your own floor plan by following the directions below.

When homes and buildings are designed, the builders use a floor plan to help them know how and where to build certain parts of the home. There are many different components, but let us look at one. The floor plan below is the first floor of Monticello. Make your own floor plan of either your current home or a dream home you imagine, just like Jefferson did. Make sure to include details like windows and doors following the examples given; see if you can copy the floor-plan style.



-  wall
-  double door
-  window
-  single door
-  sink
-  pillar
-  fireplace
-  turned stairs
-  stairs



THE CULPER SPY RING & LAFAYETTE

Read the following and complete the activity at the end of the extension:

During the Revolutionary War, the Patriots were at a huge disadvantage. King George III had tens of thousands of European soldiers at his command. These armies were formally trained, while the American armies were composed mostly of volunteers. They were outranked and inexperienced. General Washington would need to get creative in order to surprise the enemy. He needed inside information.

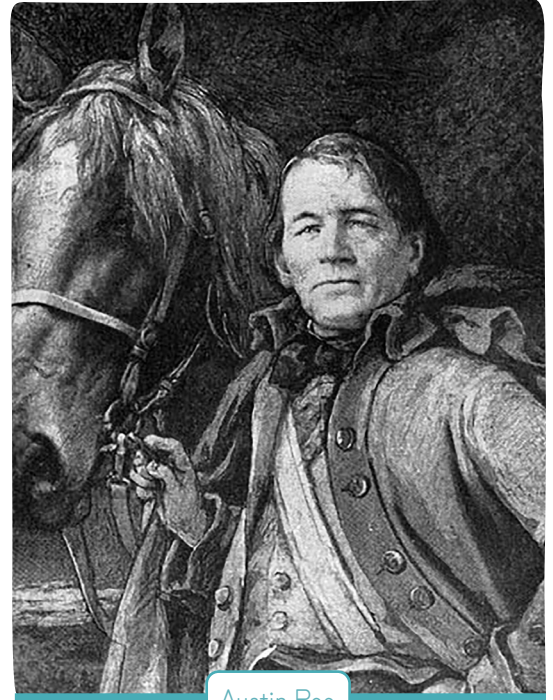
You previously learned about Nathan Hale, one of the first American spies in the Revolution. Despite his failure Washington did not give up. Instead he gave one of his generals, Major Benjamin Tallmadge, a mission to assemble a group of spies willing to give their lives for the cause. This group would come to be called the Culper Spy Ring, which Washington led under the alias Agent 711.

The Culper Spy Ring worked in the midst of enemy territory: Long Island, New York. At the forefront of these operations was Abraham Woodhull, a seemingly unassuming farmer who collected intelligence on future British movements. This information was then passed along carefully through a network of spies before finally reaching Washington.

Many members of the Culper Spy Ring were not rich or extraordinary. Austin Roe, a tavern owner, smuggled important information and packages into Manhattan while restocking his wares, and Anna Smith Strong, the wife of a Patriot spy, delivered her husband's messages through hung-up laundry. Each spy showed incredible bravery and cunning in his or her attempts to outwit the British. Sometimes the spies would even pass along false information to mislead those who suspected them. Every move was carefully calculated, and because of this the United States was able to stay one step ahead in a war it once had no hope of winning.

Meanwhile, not everyone in Europe shared Britain's views. Lafayette, whom you learned about in the lesson, was inspired by the Patriots' fight for independence. "If what you say of those Colonies is true," he told company over dinner, "they deserve their liberty, and I, for one, would like to help them."

Lafayette's sympathy for America was heavily discouraged by those around him. Britain and France were currently on agreeable terms, and such a prominent member of the nobility joining the opposite side of the war could rope France into the conflict. If Lafayette wanted to go to America, it would be at risk of arrest.



Austin Roe

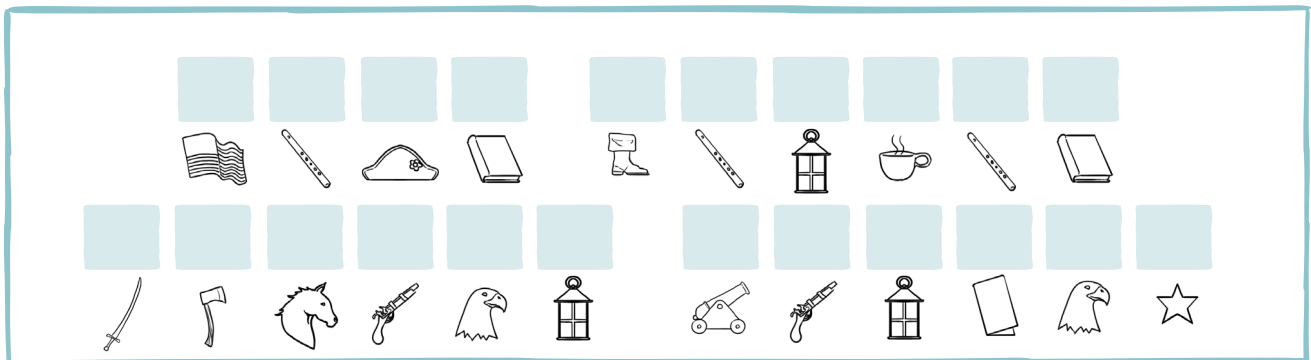
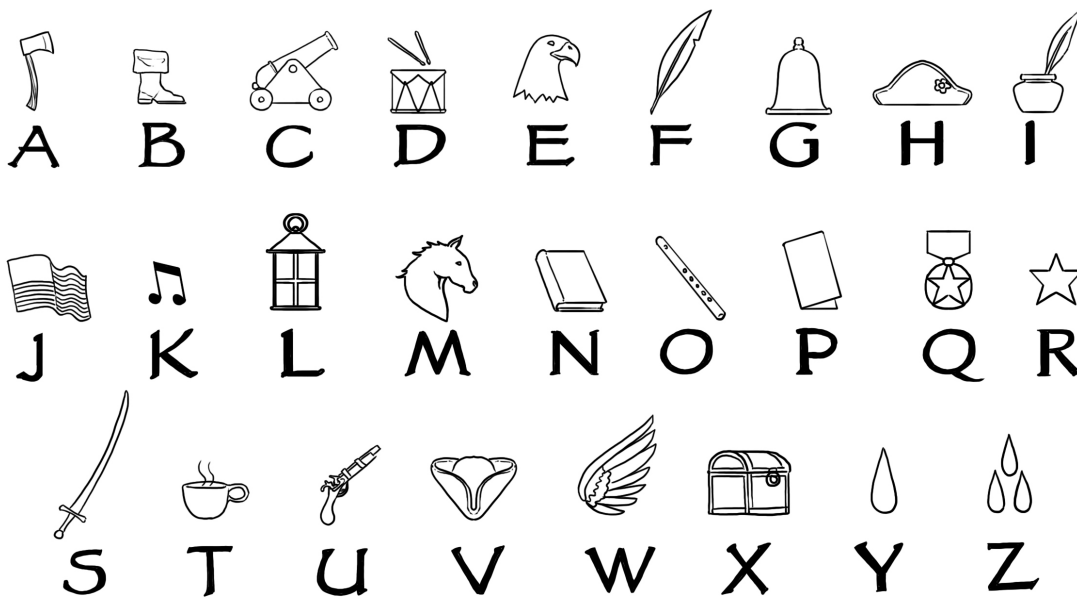


Lafayette

This did not discourage the young noble. With encouragement from his wife, Lafayette made arrangements to sail across the Atlantic. He was discovered and soon arrested, but even this did not stop him. Disguising himself, he was able to slip out of the arresting party unnoticed. By the time his captors realized they had been tricked, he was on course for the colonies.

Upon docking in South Carolina, Lafayette was received with welcoming arms once his purpose to fight with the Patriots was known. The young man was soon introduced to George Washington, who happily accepted him into his ranks. Though he was only 19, Lafayette showed great courage in rebelling even against his own nation. It was because of his firm loyalty to America, perhaps, that France eventually allied with the Patriots, offering its help in the Revolution.

Ben Tallmudge and Abraham Woodhull were two spies during this time who used different names or aliases. Use the code below to discover their secret names.

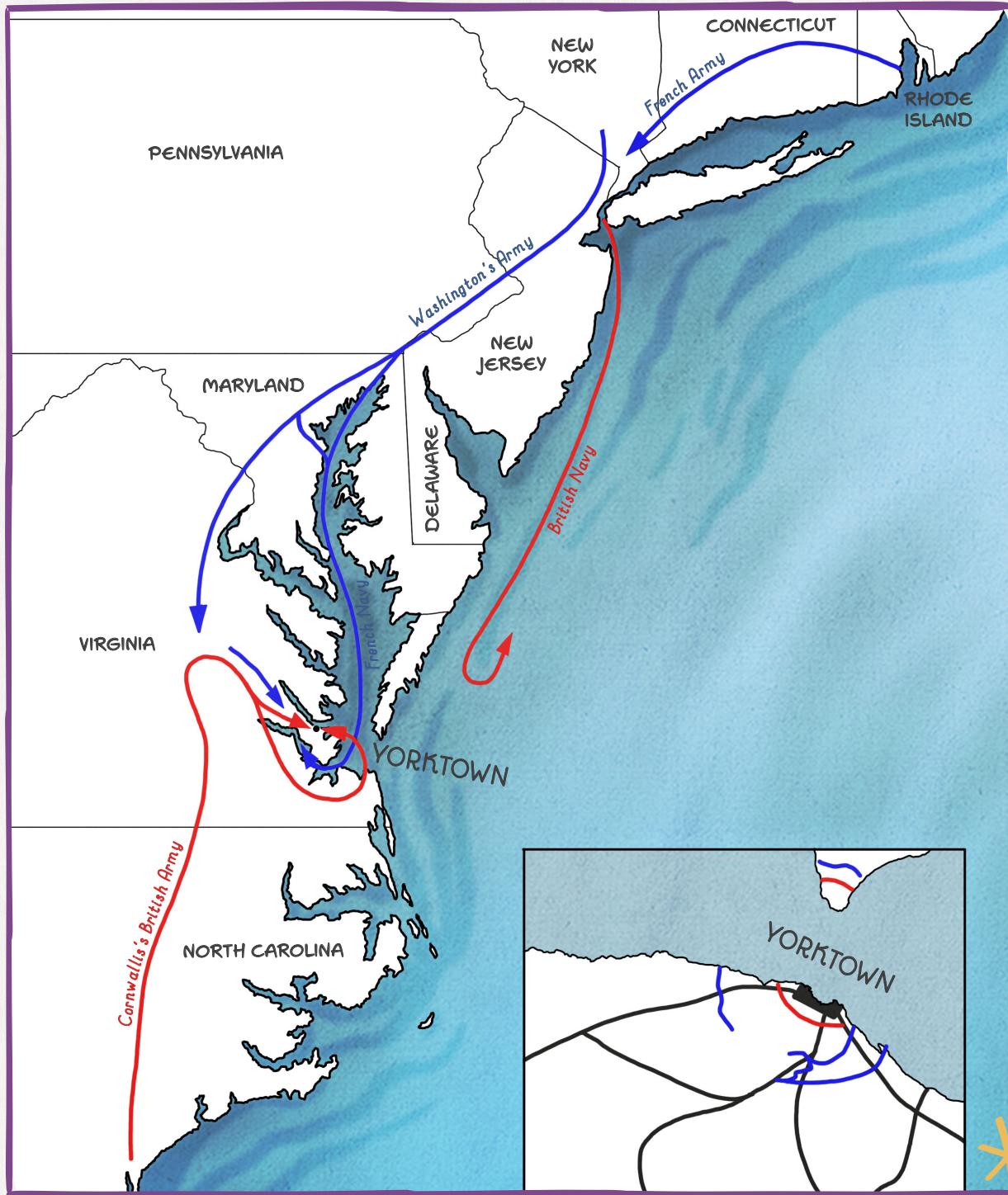


Bonus: Write a message to a friend or family member using the code above, omitting small details as needed, and then have him or her translate it to read your message.

BATTLE OF YORKTOWN MAP

LESSON
48

Follow the instructions in the course book to complete the activity using the map below.



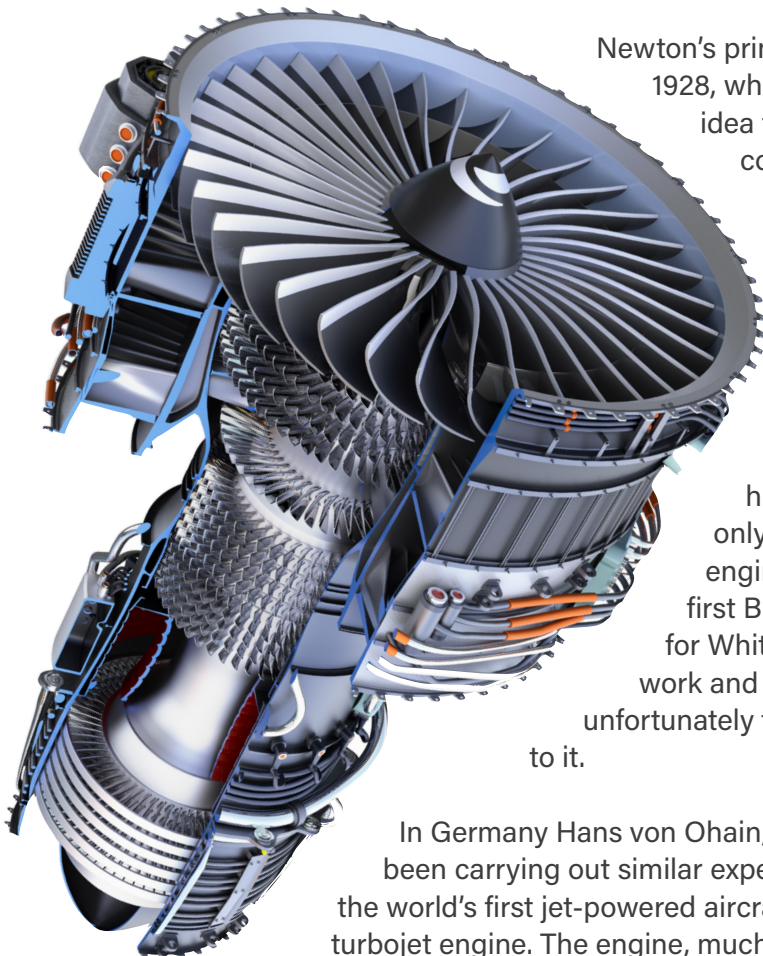
HISTORY OF THE JET ENGINE

Read the following and complete the activity at the end of the extension:

When it comes to the history of flight, few advancements have been as revolutionary as the creation and implementation of the jet engine. The jet engine had a huge impact on military combat tactics and movement. But perhaps more significantly, the social impact of the jet engine has been immeasurable. The commercial use of jet engines allows many more people, not just the super wealthy, to travel the world in relative speed and comfort. Let us explore the story behind the development of this revolutionary invention.

The science behind the jet engine was proposed back in the 1700s by Sir Isaac Newton. You may have already studied Newton's third law of motion, which states, "For every action there is an equal and opposite reaction." This principle forms the basis for Newton's idea that by focusing the power of an explosion out the back of a machine, the machine itself could then be propelled forward at high speed. This forward-pushing force is called *thrust*, and a jet engine uses this principle to move a plane forward.

So how did Newton's concept translate into a jet engine? In very basic terms, a jet engine uses a fan to draw air in at the front of the engine. The air is then compressed and sprayed with fuel. The fuel is ignited, and the burning gas expands, blasting out of the back nozzle, creating an enormous amount of forward thrust. This allows a jet-powered plane to fly at speeds about twice as fast as the piston-powered propeller that airplanes had been using.



Newton's principle was actually applied to a jet engine in 1928, when British-born Frank Whittle proposed the idea to his teachers and peers at the Royal Air Force college. He was only 21 years old, and those he shared his theories with did not take him seriously. They tried to convince him it would never work! But that did not stop Whittle. He moved forward and secured a patent for a turbojet engine in 1930. Can you imagine how tough it must have been to keep going when everyone was trying to talk him out of it? Seven years later Whittle finally tested his engine for the first time, but on the ground only. It would be another four years before Whittle's engine would be placed in a Gloster E.28/39—the first British jet airplane. It must have been thrilling for Whittle to see the result of all those years of hard work and dedication flying through the sky in 1941, but unfortunately for him, someone else had already beaten him to it.

In Germany Hans von Ohain, working for aircraft builder Ernst Heinkel, had been carrying out similar experiments with jet propulsion. On August 27, 1939, the world's first jet-powered aircraft, a Heinkel He 178, took flight using Ohain's turbojet engine. The engine, much to everyone's amazement, worked just as

they had hoped. Inspired by Ohain's success, other talented engineers and designers built upon his work to create even more advanced engines used in jet fighter planes.

During World War II, the British shared the plans for Whittle's jet engine with the United States. General Electric Company used the plans to build the engines used in the United States' first jet fighter, the Bell XP-59A. But these early jet engines used a huge amount of fuel! They needed a way to decrease fuel consumption. Fortunately, when Germany surrendered at the end of World War II, the United States took the country's jet-engine research as part of Germany's war reparations. Pratt & Whitney, another American engine builder, used the lessons learned from both the British and German engineers and succeeded in developing a new design that provided better performance with less fuel needed.

Over the next several decades, further variations were made to the original jet engine. These developments made for quieter engines that used less fuel and were easier to service and maintain. Because of the tremendous amount of thrust provided by these more efficient jet engines, commercial airplanes could now be made larger, accommodating more passengers in a single flight. These advancements allowed for a decrease in the cost of air travel and an increase in the number of people booking commercial flights. This boom in air travel is referred to as the Jet Age.

The jet engine made it possible to travel the world in a matter of hours instead of days or weeks. It opened up new opportunities for business, tourism, and global connections. So the next time you hop on a flight to visit family or look up and see a jet airplane flying through the clouds, take a moment to appreciate the revolutionary invention of the jet engine.



1. Unscramble the words below. All the words can be found in the lesson extension. (Hint: Four of them are names from the extension.)

TNWOEN

TLHWITE

ONIAH

EKHIENL

AREIOVORTNYLU

TJE GENNIE

USTTHR

ENIIONVTN

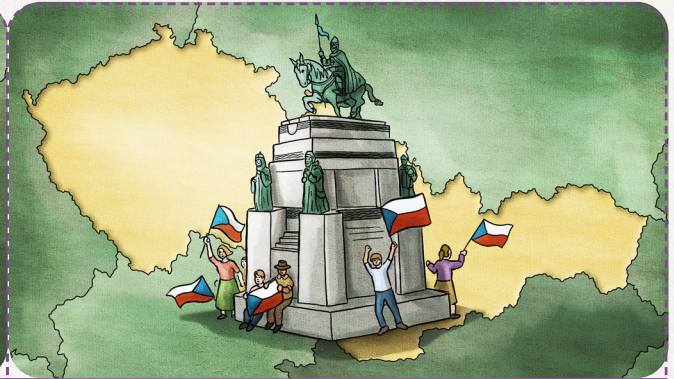
2. What is another invention you feel was revolutionary? Write three or more sentences describing how this innovation changed the way we live and interact with the world.

⇒ § COLD WAR TIME LINE § ⇒

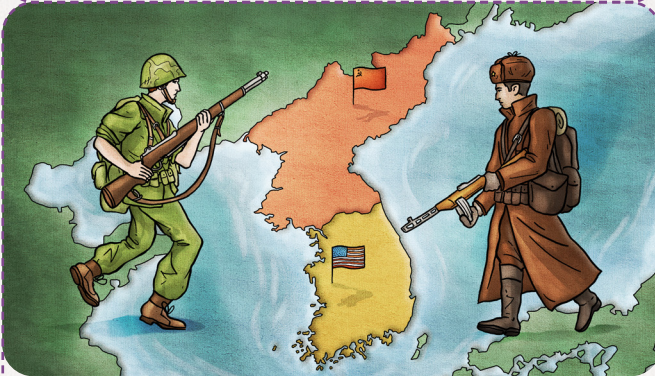
LESSON.
58



AD 1956: The people of Hungary rose up in rebellion against communist rule.



AD 1968: The people of Czechoslovakia challenged communist rule.



AD 1950–1953: The Korean War was the first major conflict of the Cold War, with the Soviet Union and the United States taking sides.



c. AD 1922–1953: Joseph Stalin led the Soviet Union with cold brutality.



AD 1949: Chinese ruler Chiang Kai-shek was replaced by Mao Zedong, who began to spread his communist ideas.



AD 1950: Radio Free Europe began broadcasting.

INVENTION OF THE RADIO

Read the following and complete the activity at the end of the extension:

What do playing with remote-controlled toys, rescuing ships at sea, and studying space all have in common? All three can be traced back to one incredible invention—the radio.

It is hard to imagine life without modern conveniences that allow us to instantly connect with others on a global scale. However, it was not too long ago that people had to rely on letters carried by boat or on horseback to receive their news. Perhaps this is why many brilliant men and women devoted their lives to inventing technology that could bring distant lands and people closer together.

Guglielmo [goo-lee-EL-mo] Marconi was one such man who devoted his life to science. His groundbreaking discoveries paved the way for much of the modern communication we enjoy today. Marconi, born in 1874, was an Italian physicist, electrical engineer, and winner of the Nobel Prize in Physics in 1909. But like many great individuals, Marconi started out as a young boy with a keen sense of curiosity and great desire to learn.

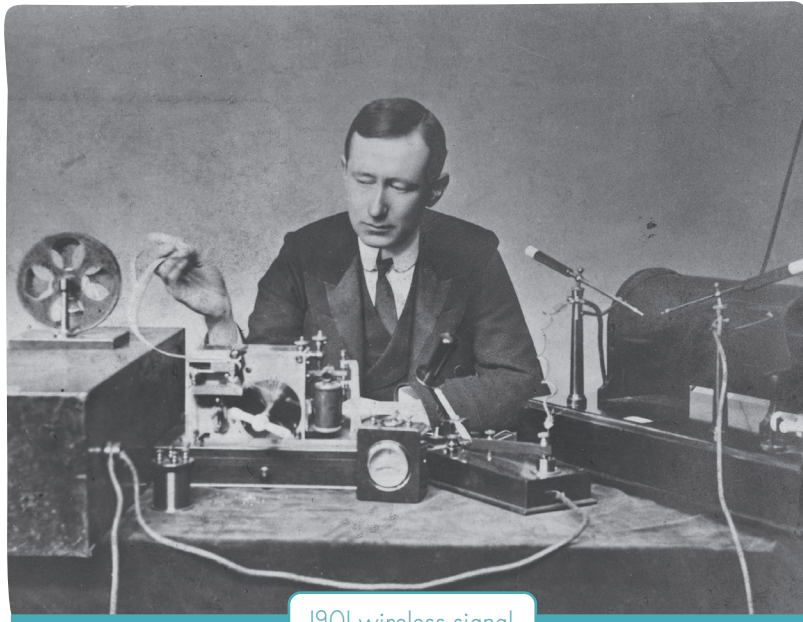
As a young man, Marconi began studying the works of Heinrich Hertz, who had recently discovered that radio waves could travel through the air, just like heat waves and light waves. This fascinated Marconi, and he wondered if he could use this concept with the telegraph. Up until this time,

telegraphs had to transmit their signals through wires. Many scientists had tried to figure out a way to make a wireless telegraph, but they were all unsuccessful.

At age 20 Marconi began experimenting. He wanted to discover if he could use radio waves to develop a wireless telegraph system. Two years later he created a radio transmitter that successfully sent radio waves across the room to a receiver. When he pushed a button on the transmitter, a bell rang on the receiver across the room. This was a great accomplishment, but would it work over long distances?

Over the next few years, Marconi refined his transmitters, receivers, and methods. Despite setbacks, faulty equipment, skeptics, and financial obstacles, he persevered. His hard work began to pay off as he transmitted radio

waves over increasingly greater distances. Finally, in 1901, his radio waves victoriously traveled across the Atlantic Ocean for a distance of 3,380 kilometers (2,100 miles). Scientists were shocked. Because of the curvature of the earth and due to the fact that radio waves travel in straight lines through space, they had hypothesized that long-distance radio transmission would be impossible. But Marconi's success led to the discovery of the ionosphere, a part of Earth's atmosphere charged with enough electrons to reflect radio waves back to Earth. Thus, as radio waves were transmitted across great distances, they would travel in a straight line, hit the ionosphere, and then bounce back to Earth.



1901 wireless signal

The Radio Reaches Around the World

The world quickly embraced Marconi's new technologies on land and at sea. Up until the early 1900s, military and commercial ships could only communicate with the shore or other ships through signal flags, hand signs, homing pigeons, or flares shot into the sky. You can imagine how ineffective these types of communication would be when ships traveled hundreds of miles from land and far away from any other ships. But with Marconi's discoveries, it became a standard procedure for commercial ocean liners and naval ships to be installed with Marconi's wireless telegraph systems. This proved to be not only useful for military tactics but also life-saving.

On the tragic night in 1912 when the *Titanic* hit an iceberg and began to sink, it was because of Marconi's wireless telegraphy system that the ship's crew was able to contact a nearby ship to come to their rescue. Hundreds of lives were saved as a result. The postmaster-general in Great Britain commented about this rescue: "Those who have been saved, have been saved through one man, Mr. Marconi, . . . and his marvelous invention."

Marconi's radio telegraphy, which had started out by transmitting Morse code, eventually succeeded in transmitting audio, such as speech and music. This ushered in the "Golden Age of Radio" in the United States of America during the 1930s and 1940s. In an era of economic depression and worldwide war, families across the country gathered around the radio to lift their spirits as they listened to news, music, and entertainment programs.

February 12, 1931, was a notable day in the history of the world. This was the day when Pope Pius XI, leader of the Catholic Church, broadcast his voice



to the world over the radio. Marconi introduced the pope with these words: "With the help of God, who places so many mysterious forces of nature at man's disposal, I have been able to prepare this instrument which will give to the faithful of the entire world the joy of listening to the voice of the Holy Father."

Even though it has been over a century since Marconi made his discoveries, we are still using radio waves in technology today. For example, large radio telescopes can receive radio waves from distant galaxies, giving scientists clearer pictures as they study space. Radio waves are used in air traffic control to guide aircraft as they fly. Internet Wi-Fi allows data to be transferred via radio waves. Bluetooth uses radio waves to connect devices in short range. Even remote-controlled toys operate through radio waves that are transmitted from the remote (transmitter) to the toy (receiver).

Who could have predicted that a young boy's fascination with radio waves would result in life-changing and life-saving communication inventions? From saving ships at sea to hearing people share God's word, we owe much to Guglielmo Marconi.

Before people discovered how to transmit speech via radio waves, Marconi's early radio telegraphy used Morse code, a system of short and long sounds depicted by dots and dashes. Use the Morse-code alphabet system below and learn how to spell out S-O-S, an acronym for "Save Our Ship" that was used to rescue ships out at sea. Then learn how to spell your name using Morse code. Finally, see if you can crack the code below, timing how long it takes you to complete. It is a quote from the Bible that was used during the first public demonstration of Morse code in 1844.

A	B	C	D	E	F	
• —	— •••	— •••	— ••	•	••• —	
G	H	I	J	K	L	M
— — •	••••	••	• — — —	— •• —	• — ••	— — —
N	O	P	Q	R	S	T
— •	— — — —	• — — •	— — •• —	• — •	•••	—
U	V	W	X	Y	Z	
••• —	••• —	• — — —	— ••• —	— •• — —	— — •••	

Morse code key

• — — — •••• • — — —
 •••• • — — — ••••

— — — • — — — — — •••

• — — — •••• — — — — •••• — — — • •••• —



How long did it take?

Time :