

# Mesopotamia

# INVENTIONS



PRIMARY  
TOPIC  
SHOP

# INVENTIONS

Every day, we benefit from the inventions of people who lived thousands of years ago. The bicycle uses the wheel, an invention from 3500 BCE. The types of food you eat are possible because of irrigation, a Mesopotamian invention. The first maps were drawn on clay tablets in Mesopotamia, and without maps, we wouldn't have **GPS** technology. Here are some **innovations** and inventions of the Mesopotamians that had the biggest **impact** on future civilizations.



## THE WHEEL

At first, the wheel was invented for pottery making. The wheel and axle were invented around 3500 BCE by the Sumerians. The wheel was a flat, circular piece of wood or stone, and the axle was a rod or shaft attached to the middle of the wheel. When the axle rotated, the wheel rotated as well. Hundreds of years later it was used for carts and chariots, replacing the sleds that were used to move objects. Eventually, the Mesopotamians figured out that if they **hollowed** out parts of the wheel, it was lighter and faster.



## WRITING

Around 3200 BCE, Sumerians developed one of the earliest known writing systems, known as cuneiform. At first, writing was used to record **transactions**. They made wedge-shaped marks on clay tablets using a reed and each **pictogram represented** an object. As this written language **evolved**, new symbols were made that represented sounds and **concepts**. This allowed people to write about **abstract** ideas and stories, like the Epic of Gilgamesh, a poem about a cruel king who makes a friend and changes his ways.



## MAPS

Early versions of Mesopotamian maps were used from around 2500 BCE. One of the earliest surviving maps is the Babylonian Map of the World which was engraved on a clay tablet in Babylon around 600 BCE. It showed Babylon and the cities, rivers, islands and seas around it. These early maps **evolved**, eventually paving the way for modern **GPS** systems and **accurate** navigation worldwide.



## WEAPONS

In response to the challenges of their time, Mesopotamian cultures like the Akkadians and Assyrians improved the materials and designs of weapons. They introduced innovations like spears with sharp bronze tips, powerful bows, and arrows with flint or bronze arrowheads, making it easier for them to defend their city-states and conquer new territories.

The Assyrians became a **dominant** force in Mesopotamia in the 24th century BCE partly because their use of iron weapons gave them an advantage over their neighbors whose weapons were made of wood and bronze.



## THE SAIL

The oldest known sails are from around 3500 BCE, made by the Sumerians. Since Sumer was located between two wide rivers, the Tigris and the Euphrates, Sumerians invented the sail to make it easier to trade with their neighbors across and along the rivers.

The first sails were square or rectangular and made from linen (a cloth made from flax plant fibers) or papyrus (a flexible sheet made from processing the stem of papyrus plants).



## WINE AND BEER

Wine was invented around 6000 BCE by various civilizations around the world. Grapes were grown in Mesopotamia and the Zagras mountains and juice from the grapes was fermented to make wine. Wine became an important part of their culture and trade.

The Sumerians probably began brewing beer around 4000 BCE. Traces of beer were found in a 5,000-year-old jug in Iran. Scientists analyzed the residue on the jug and figured out the beer had been made by fermenting barley.

One of the few ways Mesopotamian women could earn a living was by brewing beer. Women could also own and run a tavern. Babylonian laws from over 4,000 years ago refer to tavern owners as women.

### did you know?

The patron deity of beer was the goddess Ninkasi. A Sumerian hymn from 1800 BCE praises Ninkasi and includes a recipe for beer made from barley bread.



## IRRIGATION

Irrigation is the process of supplying water to crops. People were farming the land in Mesopotamia by 8500 BCE, but their farms sometimes suffered from droughts. Irrigation was developed around 6000 BCE by the Sumerians. They dug canals to bring water to the land from the rivers. In about 3000 BCE, Mesopotamians started using a device called a shaduf. The shaduf had a horizontal pole mounted on a see-saw with a bucket hanging from one end and a weight on the other end. This allowed farmers to easily fill the bucket with water and swing it around to be emptied in the field or into a canal.



## THE CITY

People in the fertile valley were originally **nomadic** hunter-gatherers, but farming and irrigation allowed the people of Mesopotamia to stay in one place. They formed mud into bricks and dried them in the desert sun. These bricks were used to build permanent structures. Some

of these settlements grew into cities.

One of the first cities in the world was Uruk in Sumer. In the third millennium BCE, Uruk was a collection of mud brick buildings, decorated with mosaics. The city was built up over the years. At its height, the city was home to about 50,000 people. It was surrounded by a wall and had large temples called ziggurats. The largest of these ziggurats was dedicated to the god Anu and rose about 40 feet high.



## TIME

Have you ever wondered why an hour had sixty minutes instead of one hundred? Or why there are 24 hours in a day? This way of measuring time was invented in Mesopotamia 5,000 years ago. The Sumerians had a Sexagesimal numerical system, also known as base-60.

We now have a base-10 numbering system. If we were inventing time tracking now, we might split an hour into 100 minutes. When Sumerians and Babylonians tracked time, they split an hour into 60 minutes, and we have kept that same system for thousands of years!

Babylonians used a sundial to tell the time. A sundial is an object that lets you tell the time from where the sun's shadow falls. As the sun's position in the sky moves during the day, the shadow cast by a part of the sundial will move around the base. Markings on the base indicate the time.

The Sumerians also divided a day into 24 hours, 12 hours for the day and 12 hours for the night.

## LEGACY

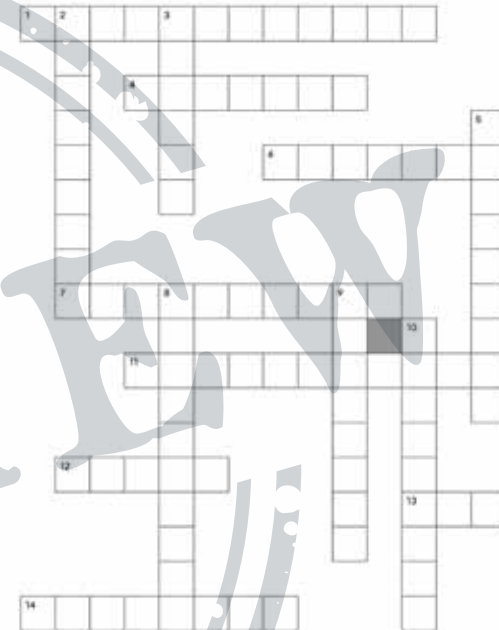
These Mesopotamian innovations were adopted by different civilizations, right up until today. They were the first to write stories, create laws, build cities and irrigate crops. The next time you read a book or walk through a city, think of those clever Mesopotamians who, thousands of years ago, set the stage for the world we live in now!



## VOCABULARY

<b>Abstract</b>	An idea without a physical form
<b>Accurate</b>	Something that is correct and precise; exact
<b>Analyze</b>	To seek a meaning for something or to think through a problem, examine
<b>Base 60</b>	A numbering system that uses the number 60 as a base (unlike the modern base 10 numbering system. Some measurements are still made with a type of base 60 system, like time and angles)
<b>Canal</b>	A man-made passage or trench filled with water, waterway
<b>Civilization</b>	A human society the has reached a high level of government and culture
<b>Concept</b>	A thought or abstract idea
<b>Cuneiform</b>	The one of the earliest known writing systems, made by pressing a reed stylus onto a clay tablet, creating a wedge-shaped mark
<b>Dominant</b>	Having power or control over others; superior
<b>Evolve</b>	To develop slowly, change
<b>Establish</b>	To create something long lasting, set up
<b>Fermentation</b>	The breakdown of a substance creating new chemicals like alcohol
<b>GPS</b>	Global Positioning System - a network of satellites that show the location of something
<b>Hollow out</b>	Make empty on the inside
<b>Horizontal</b>	Something that is level with the horizon, level
<b>Impact</b>	A big effect, influence
<b>Innovation</b>	A new idea or a new way of doing things
<b>Irrigation</b>	A system of delivering water to land for farming
<b>Nomadic</b>	A lifestyle where people move from one place to another
<b>Pictogram</b>	An image that represents a word, symbol
<b>Represent</b>	To show or describe something; symbolize
<b>Residue</b>	A substance that remains after the main portion has gone; remnant
<b>Third Millennium BCE</b>	The years from 3000 BCE to 2001 BCE
<b>Trace</b>	A very small amount
<b>Transaction</b>	An arrangement where two people trade something; trade

## VOCABULARY CROSSWORD



## ACROSS

- The breakdown of a substance creating new chemicals like alcohol
- A thought or abstract idea
- A substance that remains after the main portion has gone; remnant
- Something that is level with the horizon, level
- An arrangement where two people trade something; trade
- A man-made passage or trench filled with water, waterway
- Global Positioning System - a network of satellites that show the location of something.
- Having power or control over others; superior

## DOWN

- To create something long lasting, set up
- To develop slowly, change
- To show or describe something; symbolize
- A system of delivering water to land for farming
- Something that is correct and precise; exact
- An image that represents a word, symbol

## TRUE OR FALSE

Circle T (True) or F (False) for each of the following statements.

- 1 The first sails were triangular and made from nylon. T F
- 2 The wheel was invented by the Babylonians in 1792 BCE. T F
- 3 The Sumerians developed the earliest know writing system known as cuneiform. T F
- 4 One of the few ways a Sumerian woman could earn a living was by brewing beer. T F
- 5 A shaduf was a device used to write cuneiform. T F
- 6 Mesopotamian cities had large temple called ziggurats. T F
- 7 Clay weapons helped the Assyrians become a dominant force in the 24th century. T F
- 8 One of the earliest surviving maps is the Babylonian Map of the World. T F
- 9 The Sumerians split an hour into 100 minutes. T F

## COMPREHENSION QUESTIONS

- 1 What was the wheel originally invented for?  
 (A) Moving carts and wagons (B) Pottery making  
 (C) Spinning thread (D) Steering ships
- 2 How did the invention of the boat help the Mesopotamians with trade and exploration?
- 3 What type of writing was used to write the Epic of Gilgamesh?  
 (A) Hieroglyphics (B) Cursive  
 (C) Cyrillic (D) Cuneiform
- 4 What did Mesopotamians ferment to make wine? Beer?
- 5 What did Mesopotamians invent to protect their crops from drought?  
 (A) Irrigation (B) Fermentation  
 (C) Navigation (D) Representation
- 6 How tall was the ziggurat in the city of Uruk?  
 (A) 20 feet (B) 40 feet  
 (C) 85 feet (D) 120 feet
- 7 What innovation gave the Assyrians an advantage in the 24th century BCE?
- 8 How does the Sumerian numbering system influence how we measure time?

**DEBATE**

Cut up the squares below and put into a container for students to draw from.

Split the class into eight groups. Each group will draw one of the inventions below. Each group will research their invention and come up with arguments for why their invention has had the most impact on today's society.

Pair up the groups and have them debate each other. Give each team a set time to make their case and a set time for a rebuttal. At the end, the rest of the class will choose a winner by a show of hands. The winner of each pairing will move onto the next round. You can use the chart on the next page.

**INVENTIONS DEBATE LESSON PLAN****OBJECTIVE:**

Students will research and debate the impact of Mesopotamian inventions on today's society, developing critical thinking and persuasive communication skills.

**DURATION:**

Two 60-minute class periods (plus additional time for debates if needed)

**COMMON CORE:**

CCSS.ELA-LITERACY.SL.6.1: Engage effectively in a range of collaborative discussions.

CCSS.ELA-LITERACY.W.6.1: Write arguments to support claims with clear reasons and relevant evidence.

CCSS.ELA-LITERACY.W.6.8: Gather relevant information from multiple print and digital sources.

**INTRODUCTION:**

Discuss the importance of inventions in shaping societies and how they impact our daily lives.

Introduce the Mesopotamian inventions to be debated, explaining that each group will research and argue why their assigned invention has had the most impact on today's society.

Briefly go over the rules and structure of the debate activity.

**ACTIVITY - RESEARCH AND PREPARATION**

Split the class into eight groups, ensuring an even distribution of students.

Have each group pick an invention square from a container.

Instruct each group to research their assigned invention, considering historical context and present-day applications.

Ask groups to brainstorm arguments supporting the impact of their invention on today's society and prepare a brief presentation.

**DEBATE:**

Pair up the groups and assign specific debate match-ups.

Each team will have a set time (e.g., 5-7 minutes) to present their arguments, followed by a set time for a rebuttal (e.g., 3-5 minutes).

Encourage students to use persuasive language, provide evidence, and engage with opposing arguments during the debate.

After each debate, allow the rest of the class to choose a winner through a show of hands.

Record the winners on the knockout chart.

**CLASS DISCUSSION:**

Ask students to share insights gained from researching and debating the impact of Mesopotamian inventions.

Discuss the challenges faced during the debates and how students approached counterarguments.

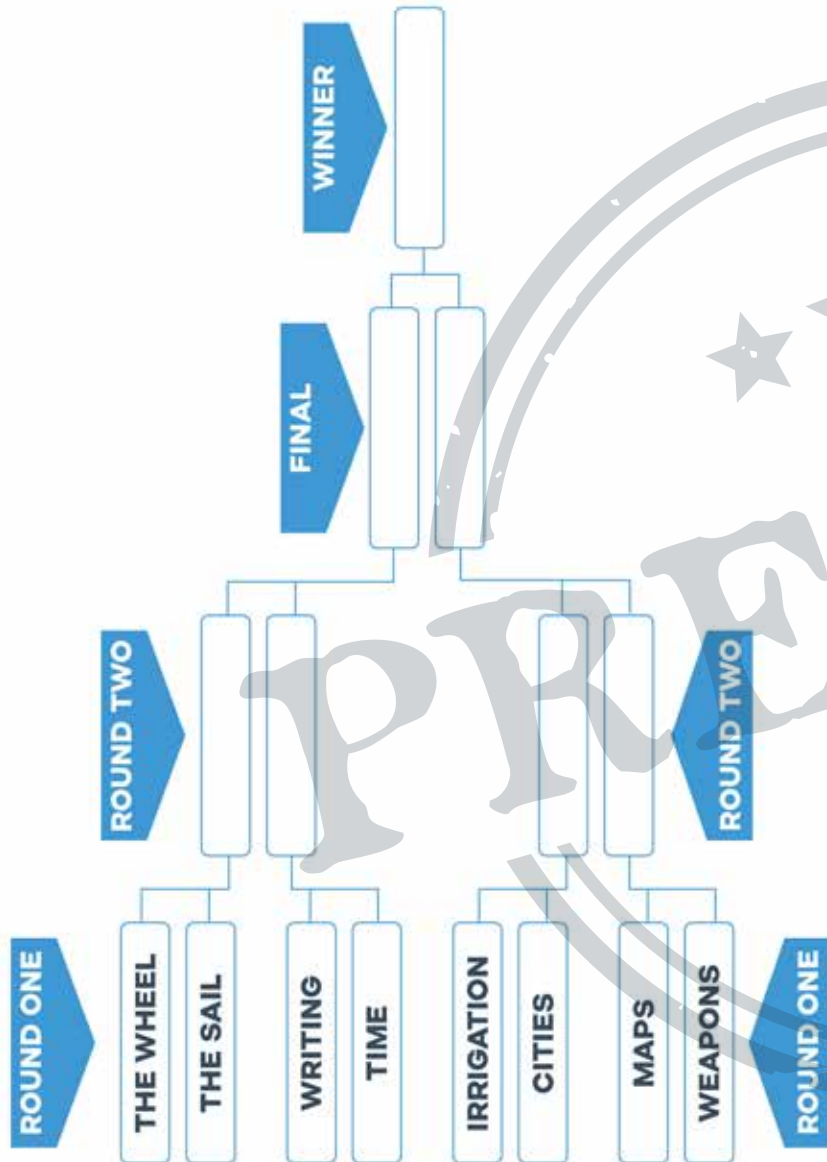
**ASSESSMENT:**

Participation in research and preparation.

Performance during the debate, including the quality of arguments and rebuttals.

Engagement in class discussion and reflection.





## MAKE A CLASS SUNDIAL

For this method, you will need a section of pavement that is in full sun all day.



### SUPPLIES

- 15 inch long string
- Chalk
- Clay
- 30 cm length of dowel or a long pencil
- Wristwatch

### WHAT TO DO

1. Use the clay to make a base for the dowel (or pencil) so it stays upright and stick it in the middle of the pavement.
2. Tie one end of the string to the dowel (or pencil) and the other end to the piece of chalk.
3. While keeping tension on the string, draw a circle around the dowel (or pencil).
4. Using the watch, every hour, draw a line following the shadow from the dowel to the circle and write the time.

*What do you notice about the spaces between each hour?*

## MAKE A CLASS SUNDIAL LESSON PLAN

### OBJECTIVE:

Students will collaboratively explore the concept of timekeeping using a sun clock, allowing them to understand how ancient civilizations, such as the Mesopotamians, used similar methods to measure time. Students will also observe and analyze the spaces between each hour on the sun clock.

### DURATION:

One 90-minute class period

### COMMON CORE:

CCSS.ELA-LITERACY.RI.5.3: Explain the relationships or interactions between two or more individuals, events, ideas, or concepts in a historical, scientific, or technical text based on specific information in the text.

CCSS.ELA-LITERACY.W.5.2: Write informative/explanatory texts to examine a topic and convey ideas and information clearly.

### INTRODUCTION:

Begin by discussing the ancient methods of timekeeping, particularly the use of sun clocks in civilizations like Mesopotamia.

Introduce the collaborative activity by explaining that the class will work together to create a sundial and observe the spaces between each hour on the clock face.

Connect the concept of the sun clock to the importance of the invention of time tracking.

### ACTIVITY:

As a class, set up a large outdoor space where the sun clock will be created.

Assign different roles to students for various

tasks, such as preparing the clay base, securing the dowel or pencil, tying the string, drawing the circle, marking the time every hour.

Encourage students to discuss their observations and thoughts as they work on the sun clock.

### DISCUSSION:

Once the sun clock is complete, gather the class in a circle around the sundial for a discussion.

Ask students to share their observations about the spaces between each hour on the sundial.

Discuss the concept of dividing time into equal intervals and how this relates to the measurement of time in Mesopotamia.

Discuss what effect time tracking might have had on the lives of Mesopotamians.

### WRITING ASSIGNMENT:

Have students work together to create a collaborative paragraph explaining their observations about the spaces between each hour on the sun clock.

Encourage them to use specific details from the activity and the discussion to support their explanations.

Discuss and finalize the paragraph as a class, emphasizing collaboration and teamwork.

### ASSESSMENT:

Participation in the collaborative creation of the sun clock.

Quality of the collaborative paragraph, assessing the understanding of the spaces between each hour on the sun clock.

## PAPER SUNDIAL

For this method, each student can make their own sundial.



### SUPPLIES

- 2 paper plates per student
- Sand
- 1 paper straw (or pencil or stick) per student
- Glue
- Markers
- Wristwatch
- Compass (optional)

### WHAT TO DO

1. Place one of the paper plates face-up and fill with sand (this is to weight it down so the sundial does not move).
2. Glue the other paper plate upside-down on top of the first paper plate.
3. Pierce the center of the top paper plate and stick the straw in the hole, pushing it down into the sand so it stays vertical. **OPTIONAL:** Use a compass to angle the straw towards North. When your sundial is done you can move it and use it somewhere else as long as the straw is angled North.
4. On a sunny day, place the paper plate in a location that gets full sunlight all day. (Do not move it from this spot!)
5. Using the watch, every hour, use the markers to mark the location of the straw's shadow on the edge of the plate. Label it with the time.
6. When your sundial is finished you can decorate it.

Now you have a sundial! As long as you keep it in the same location, you should be able to use it to tell the time.



## PAPER SUNDIAL LESSON PLAN

### OBJECTIVE:

Students will understand how the Sumerians and Babylonians tracked time using sundials, gaining insight into Mesopotamian inventions and their impact on daily life.

### DURATION:

Two 45-minute class periods, plus extra time each hour.

### COMMON CORE STANDARDS:

CCSS.ELA-LITERACY.RI.4.3: Explain events, procedures, ideas, or concepts in a historical, scientific, or technical text, including what happened and why, based on specific information in the text.

CCSS.ELA-LITERACY.W.4.2: Write informative/explanatory texts to examine a topic and convey ideas and information clearly.

### INTRODUCTION:

Begin by discussing the importance of timekeeping in ancient civilizations, particularly in Mesopotamia.

Introduce the Sumerians' invention of time tracking and the Babylonians' use of sundials to measure time.

Connect the concept of timekeeping to the students' daily lives, emphasizing its significance for various activities.

### ACTIVITY:

Distribute the materials to each student.

Instruct students to follow the provided steps to create their own sundial.

Circulate the classroom to provide assistance

and ensure that students understand the purpose of each step.

Encourage students to discuss the historical context of Mesopotamian timekeeping as they work on their sundials.

### REFLECTION AND DISCUSSION (15 MINUTES):

Once all students have completed their sundials, gather them in a circle for a class discussion.

Ask students to share their observations about the sundial-making process and the historical context discussed earlier.

Connect the activity to the importance of tracking time in their daily lives and how it might have been different in ancient Mesopotamia.

### WRITING ASSIGNMENT:

Have students write a short paragraph explaining the significance of timekeeping in Mesopotamia and how the sundial they created works.

Encourage them to use specific details from the activity and the discussion to support their explanations.

Collect and review the paragraphs for comprehension and integration of historical knowledge.

### ASSESSMENT:

Student participation in the activity.

Quality of written paragraphs, assessing the understanding of the historical context and the sundial's functionality.



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## COMPREHENSION QUESTIONS

- What was the wheel originally invented for?
  - A Moving carts and wagons
  - B Pottery making
  - C Spinning thread
  - D Steering ships
- How did the invention of the boat help the Mesopotamians with trade?
 

*The invention of the sail allowed the Sumerians to use the river and wind to help them to establish trade routes and export goods.*
- Why is the Epic of Gilgamesh important?
 

*It is the longest work of ancient literature and was written in Sumerian and Akkadian.*
- What was the first writing system?
 

*Cuneiform.*
- How did the Babylonians improve navigation?
 

*They invented the compass.*
- How tall was the ziggurat in the city of Uruk?
  - A 20 feet
  - B 40 feet
  - C 85 feet
  - D 120 feet
- What innovation gave the Assyrians an advantage in the 24th century?
 

*The Assyrians use of iron weapons gave them an advantage over those whose weapons were made of wood and bronze.*
- How does the Sumerian numbering system influence how we measure time?
 

*The Sumerians had a base-60 numbering system so when the Babylonians tracked time, they split an hour into 60 minutes that same system for thousands of years!*

## TRUE OR FALSE

Circle T (True) or F (False) for each of the following statements.

- The first soils were triangular and made from nylon. T  F
- The first writing system was developed by the Babylonians in 1792 BCE.
- The first writing system was developed by the Sumerians.
- The first writing system was developed by the Egyptians.
- Mesopotamian cities had large walls.
- Clay weapons helped the Assyrians become a dominant force in the region.
- One of the earliest surviving maps is the Babylonian Map of the World.
- The Sumerians split an hour into 100 minutes.

## VOCABULARY CROSSWORD



### ACROSS

- The breakdown of a substance creating new chemicals like alcohol
- A substance that remains after the main portion has gone; remnant
- Something that is level with the horizon; level
- An arrangement where two people trade something; trade
- A man-made passage or trench filled with water; waterway
- Global Positioning System - a network of satellites that show the location of something
- Having power or control over others; superior

### DOWN

- To create something long lasting; set up
- To develop slowly; change
- To show or describe something; symbolize
- A system of delivering water to land for farming
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- An image that represents a word, symbol

3 ANSWER SHEETS