

Ciphers, Code Breaking, and Scientific Discoveries – Teacher Instructions

There are three different versions of this resource included. Each one is the same but has been encoded using a different cipher – Caesar, Atbash, or Keyword. This works well if you have multiple classes and want to mix things up or want to offer your students choice.

The first thing they need to do is create their alphabet cipher or you can provide it for them if you prefer. Each cipher alphabet is and decoded discovery is below.

Prior to giving this activity, I would recommend you provide your students with my 'Ciphers and Code Breaking' reading as it will give them the background knowledge they need to understand ciphers and how to decode them. It's included in your resource bundle.

Task: Your students are to decode a specific scientific discovery using the method assigned by you. Once they have decoded the discovery, they need to research the discovery and make notes on the following information:

1. What was the discovery?
2. Who discovered it?
3. Why it was/is it important?

Once they've completed their research by answering the questions above, they need to present their material in one of the following ways. They can create a(n)

- short presentation – either on Google Slides or another program.
- video explainer – usually with drawings and audio.
- infographic – on paper or online using Canva.
- poster – using poster paper.

Caesar 3-Letter Shift Cipher

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

Atbash Cipher

This section has been removed

Keyword Cipher – Keyword = OXYGEN

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

Scientific Discoveries

1) **Periodic Table of Elements** (Dmitri Mendeleev, 1869): Mendeleev organized elements based on their properties, creating the periodic table. This allowed for the prediction of undiscovered elements and greatly advanced chemistry.

2) **Penicillin**

TWF

This section has been removed

3) **Germ Theory of Disease** (Louis Pasteur, 1861): Pasteur discovered that microorganisms cause diseases, replacing the miasma theory. This led to the development of antiseptic techniques and pasteurization.

4) **Big Bang Theory** (Georges Lemaître, 1927): Lemaître proposed that the universe began as a single point and expanded to its current state. This theory is the foundation of modern cosmology.

5) **Plate Tectonics** (Alfred Wegener, 1912): Wegener proposed that Earth's continents were once joined and had drifted apart. This theory explains the formation of mountains, earthquakes, and volcanoes.

6) **Vaccines**

TWF

This section has been removed

7) **Photosynthesis** (Jan Ingenhousz, 1779): Ingenhousz discovered that plants produce oxygen in the presence of light. This process is essential for maintaining Earth's atmosphere and food chain.

8) **Transistors** (John Bardeen, Walter Brattain, and William Shockley, 1947): They invented the transistor, a semiconductor device that amplifies or switches electronic signals. Transistors are the foundation of modern electronics.

9) **Insulin**

TWF

This section has been removed

10) **Pasteurization** (Louis Pasteur, 1864): Pasteur developed a process for heating milk and wine to kill bacteria, preventing spoilage and disease. Pasteurization has greatly improved food safety.

Answer Key

Scientific Discoveries – Caesar – 3-letter shift Cipher

Encoded	Decoded
Shulrglf Wdeoh ri Hohphqvv	Periodic Table of Elements
Shqlfloodq	Penicillin
 This section has been removed	
LqvXolq	Insulin
Sdvwhxulcdwlrq	Pasteurization

Scientific Discoveries - Atbash Cipher

Encoded	Decoded
Kvirlwrx Gzyov lu Vovnmgh	Periodic Table of Elements
Kvmrxroom	Penicillin
Tvin Gsvlib lu Wrhvzv	Germ Theory of Disease
Yrt Yzmt Gsvlib	Big Bang Theory
Kozgv Gvxglmrhx	Plate Tectonics
Ezxxrmvh	Vaccines
Kslglhbmgsvhrh	Photosynthesis
Gizmhghlih	Transistor
Rmhforh	Insulin
Kzhgvfirazerlm	Pasteurization

Scientific Discoveries – Keyword Cipher – Keyword is SCIENCE

Encoded	Decoded
Lepckgcy Roxhe kEheiejrq	Periodic Table of Elements
Lejcychnq	Penicillin
 This section has been removed	
Cjqshcj	Insulin

Rubric

1. Decoding the Scientific Discovery (10 points)

- Accurately decodes the assigned scientific discovery (10 points)
- Partially decodes the assigned scientific discovery (5 points)
- Does not decode the assigned scientific discovery (0 points)

2. Research and Content (35 points)

What was the discovery? (15 points)

- Clearly and accurately describes the discovery (15 points)
- Partially describes the discovery (10 points)
- Does not describe the discovery (0 points)

Who discovered it? (5 points)

- Correctly identifies the discoverer(s) (5 points)
- Partially identifies the discoverer(s) (2 points)
- Does not identify the discoverer(s) (0 points)

Why it was/is it important? (15 points)

- Thoroughly explains the significance of the discovery (15 points)
- Partially explains the significance of the discovery (10 points)
- Does not explain the significance of the discovery (0 points)

3. Presentation (40 points)

Organization and Clarity (15 points)

- Information is well-organized and easy to follow (15 points)
- Information is somewhat organized and mostly clear (10 points)
- Information is poorly organized and difficult to understand (0 points)

Creativity and Engagement (15 points)

- Presentation is creative, engaging, and effectively communicates the content (15 points)
- Presentation is somewhat creative and engaging (10 points)
- Presentation lacks creativity and fails to engage the audience (0 points)

Mechanics and Formatting (10 points)

- Presentation is free of errors in grammar, spelling, and formatting (10 points)
- Presentation has some errors in grammar, spelling, or formatting (5 points)
- Presentation has numerous errors in grammar, spelling, and formatting (0 points)

Ciphers, Code Breaking, and Scientific Discoveries – STUDENT

Task: You are to decode your specific scientific discovery using the method assigned by your teacher. Once you have decoded your discovery, you'll do some research on the discovery and make notes by answering the following questions:

1. What was the discovery?
2. Who discovered it?
3. Why it was/is it important?

Once you've completed your research by answering the questions above, you need to present your material. You can create a(n)

- short presentation – either on Google Slides or another program.
- video explainer – usually with drawings and audio.
- infographic – on paper or online using Canva.
- poster – using poster paper.

Scientific Discoveries – Caesar – 3-letter shift Cipher

Shulrglf Wdeoh ri Hohphqwv

Shqlfloodq

TWTF

This section has been removed

Wudqvlwruv

LqvXolq

Sdvwnxulcawlrq

Scientific Discoveries - Atbash Cipher

Kvirlwrx Gzyov lu Vovnvmgh

Kvmrxroom

Tvin Gsvlib lu Wrhvzhv

Yrt Yzmt Gsvlib

Kozgv Gvxgimrxh

Ezxxrmvh

Kslghbmgsyhrh

Gizmhrhglih

Rmhform

Kzhgvfirazgrlm

Scientific Discoveries – Keyword Cipher – Keyword Is SCIENCE

Lepckgcy Roxhe kn Eheiejrq

Lejcychhcj

SALE

TWFF

This section has been removed

SA