Warm-Up | The Progress of Scientific Knowledge

Lesson Objectives

By the end of this lesson, you should be able to:

- Describe the cumulative nature of science and give examples of how a diverse group of [ ] have contributed to science.
- Explain why curiosity, creativity, openness, and skepticism are important in the progress of [ ].
- Analyze how new technologies and experiments affect previous scientific explanations.

Science Practice: Summarize the history of a scientific discovery.

Words to Know

Fill in this table as you work through the lesson. You may also use the glossary to help you.

	a process of applying, evaluating, and analyzing information in a systematic way to develop a logical answer or conclusion
	the information gathered by the systematic study of nature

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Slide 1

Lesson Question

Slide 2

Discovery of Oxygen

- Joseph Priestley, an English scientist, discovered _____ in 1774.
- Antoine Lavoisier, a French chemist, named oxygen.
- They relied on _____ from experiments.
- Their curiosity and creativity changed the course of _____.

Slide 4

Natural Sun Block

Ozone – molecule made of three oxygen atoms

- Found in the atmosphere
- Protects us from harmful _____ rays

The Process of Discovering the Cause of the Ozone Hole

Critical thinking: A _____ of applying, evaluating, and analyzing information in a _____ way to develop a logical or conclusion.

Many _____ contributed to the explanation of the _____ hole including:

- Susan Solomon
- Paul Crutzen
- Mario Molina

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Development of the Atomic Model

Dalton: Matter is made of atoms.

Thomson: Atoms contain _____.

Rutherford: The _____ of an atom is concentrated in its center.

Bohr: Electrons orbit the atomic _____.

Schrödinger and others: Electrons exist in _____ of probability.

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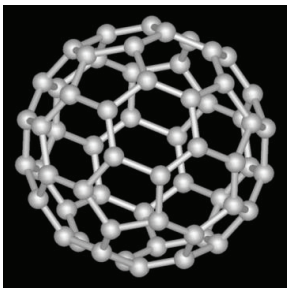
Slide 4

Discovery of a New Form of Carbon

[ ] is the information gathered by the systematic study of [ ]

- Discovery of new form of carbon:
  - Discovered by Kroto, Smalley, and Curl
  - Called buckyball
  - Led to new class of carbon [ ]: fullerenes



Current scientific knowledge leads to new discoveries and new scientific knowledge.

Slide 11

Technology Aids Scientific Progress

- New technology → New discoveries
  - New [ ] = New observations possible
- Improvements in technology → New discoveries
  - More [ ] tools = Better data
  - More powerful tools = Faster, more detailed data [ ]

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Slide 11

Scientific Progress Aids Technology

- Scientific discoveries → New technologies
  - New areas of _____
  - New substances and _____
- Scientific _____ → Improved technologies
  - Improvements in efficiency
  - Reductions in _____ effects

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Summary | The Progress of Scientific Knowledge

Lesson Question

How does scientific knowledge progress?

Answer

Slide 2

Scientists and Their Discoveries

Scientists have many [ ] that help them make new discoveries:

- Diversity
- [ ]
- [ ]
- Openness
- Skepticism

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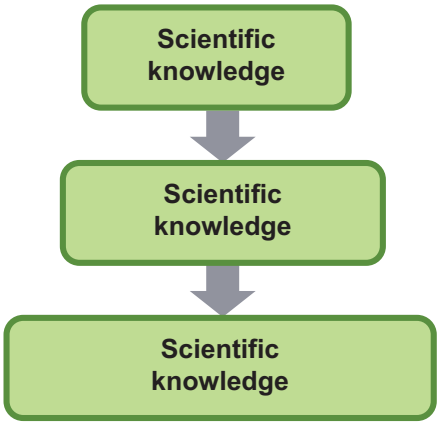
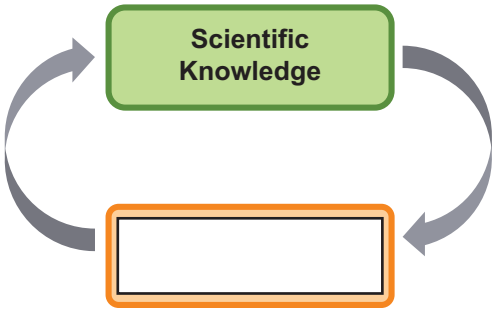
Summary | The Progress of Scientific Knowledge

Slide 2

How Scientific Knowledge is Built





New scientific knowledge leads to _____ technology, and it's a process that leads to progress in both _____ and technology.

Use this space to write any questions or thoughts about this lesson.

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