

The nature of science: Methods of science



تم تحميل هذا الملف من موقع المناهج الإماراتية

موقع المناهج ← المناهج الإماراتية ← الصف الثامن ← علوم ← الفصل الأول ← ملفات متنوعة ← الملف

تاريخ إضافة الملف على موقع المناهج: 2026-08-31 10:41:51

ملفات اكتب للمعلم اكتب للطالب | اختبارات الكترونية | اختبارات | حلول | عروض بوربوينت | أوراق عمل
منهج انجليزي | ملخصات وتقارير | مذكرات وبنوك | الامتحان النهائي | للمدرس

المزيد من مادة
علوم:

إعداد: Adel Rania

التواصل الاجتماعي بحسب الصف الثامن



صفحة المناهج
الإماراتية على
فيسبوك

الرياضيات

اللغة الانجليزية

اللغة العربية

التربية الاسلامية

المواد على تلغرام

المزيد من الملفات بحسب الصف الثامن والمادة علوم في الفصل الأول

ملخص الدرس الأول - منهج انسباير: Science of Methods The

1

نموذج اختبار تجريبي Exam Mock وفق الهيكل الوزاري منهج انسباير متبوع بالإجابات

2

مراجعة للدروس وفق الهيكل الوزاري الجديد منهج انسباير القسم الموضوعي

3

حل نموذج اختبار تجريبي وفق الهيكل الوزاري القسم الموضوعي منهج بريدج

4

نموذج اختبار تجريبي وفق الهيكل الوزاري القسم الموضوعي منهج بريدج

5



The nature of science

Methods of science



التاريخ

30/8/2026



المعلمة

Rania Adel



الصف

الثامن
أسبائير



المادة

Science



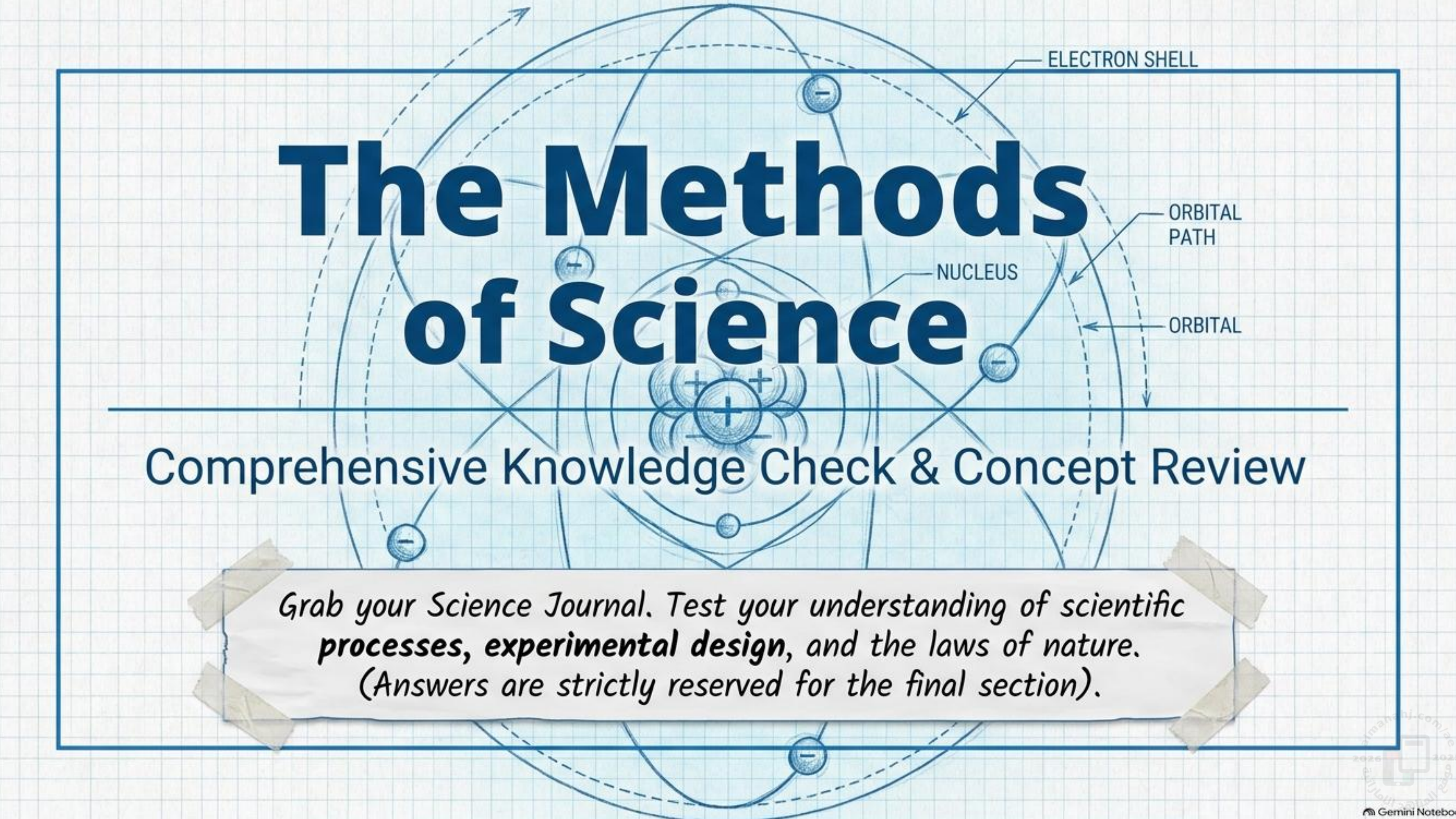
افهم



اكتشف



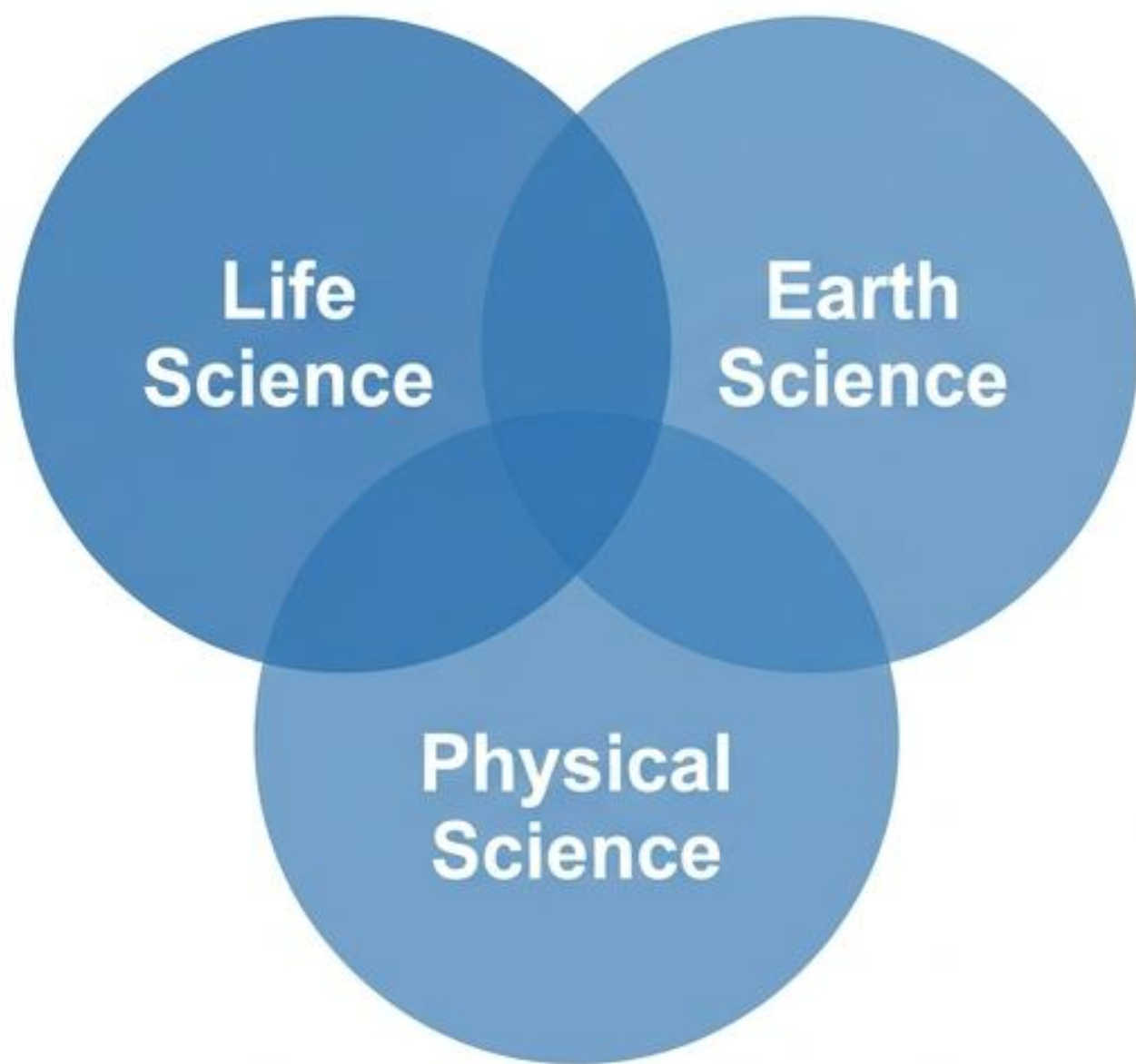
استكشف



The Methods of Science

Comprehensive Knowledge Check & Concept Review

*Grab your Science Journal. Test your understanding of scientific
processes, experimental design, and the laws of nature.
(Answers are strictly reserved for the final section).*



[Recall]

1. Multiple Choice: The word "science" originates from the Latin word *scientia*, which translates to:

- A) Experiment
- B) Knowledge
- C) Nature
- D) Observation

[Understanding]

2. Matching: Match the branch of science to its area of study:

Options: X) Earth Science, Y) Life Science, Z) Physical Science

Definitions: i) Deals with living things, ii) Investigates Earth and space, iii) Studies matter and energy.

[Understanding]

3. True or False: Scientific studies are strictly separated; a scientist cannot study both life science and physical science at the same time.



[Application]

4. Choose the Correct Answer: A scientist studying how to build better artificial limbs for humans is studying a combination of which two branches?

- A) Earth and Physical
B) Life and Earth
C) Life and Physical

[Recall]

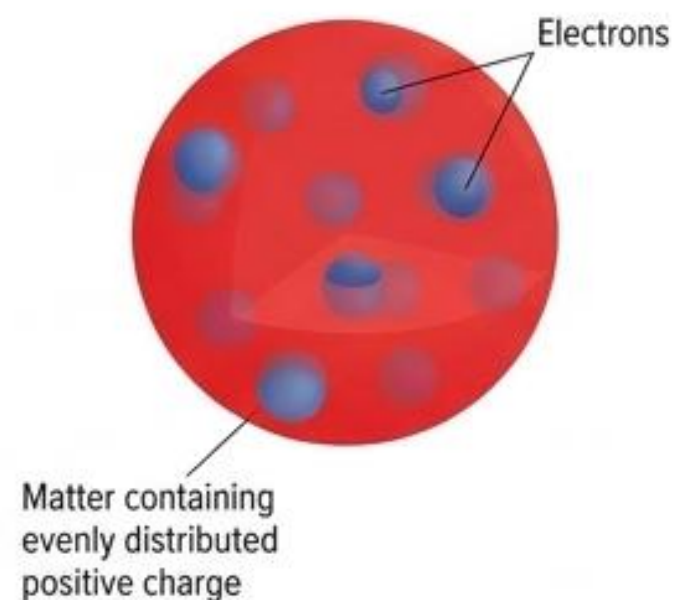
5. Fill in the Blank: Nature follows a set of _____, some of which are complex (like the human body) and some are simpler (like Earth rotating every 24 hours).

[Recall]

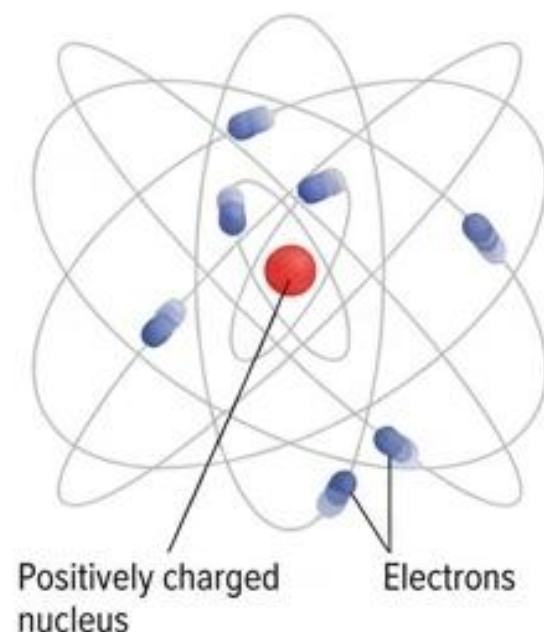
6. Multiple Choice: According to the text, how do scientists learn about the rules that govern the natural world?

- A) By only reading historical books
- B) By asking questions and making observations
- C) By guessing what happens
- D) By ignoring natural events

1904 Thomson Model



1911 Rutherford Model



Present-Day Electron Cloud Model

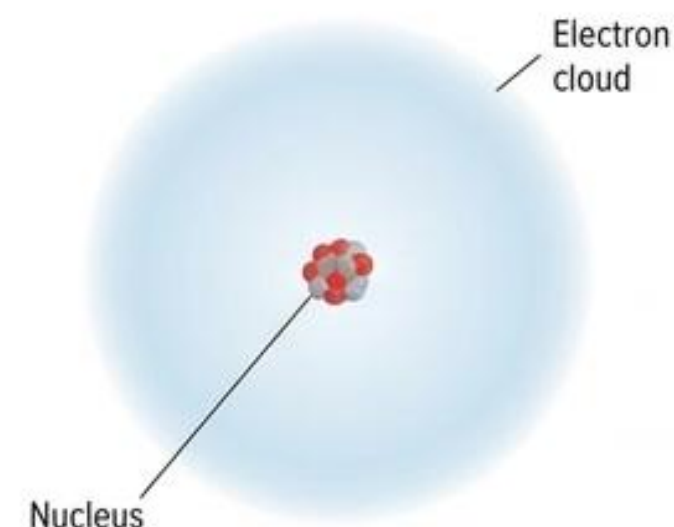


Figure 2 Our understanding of the atom has changed over time.

[Understanding]

7. Image-Based Matching: Based on the figure, match the model to its characteristic: Models: A) 1904 Thomson Model, B) 1911 Rutherford Model, C) Present-Day Model.

Characteristics: i) Positively charged nucleus with orbiting electrons, ii) Nucleus surrounded by an electron cloud, iii) Electrons embedded in a ball of positive charge.

[Recall]

8. Fill in the Blank: In the 20th century, scientists discovered that the nucleus is not a solid ball, but is made up of protons and _____.

[Analysis]

9. True or False: The electron cloud model is the final, unchangeable model of the atom because science does not modify its explanations once they are established.



[Recall]

10. Multiple Choice: Why do scientists use models?

- A) To test things that are too large, small, or hazardous
- B) Only because they look visually appealing
- C) Because real experiments are too expensive
- D) To prove that their hypotheses are always right

[Application]

11. Choose the Correct Answer: Lord Kelvin put balls into a bowl of jelly to model:

- A) How atoms bond together
- B) How light moves through space
- C) How gravity pulls objects to Earth

[Understanding]

12. True or False: A computer simulation of an aircraft landing is considered a type of scientific model.



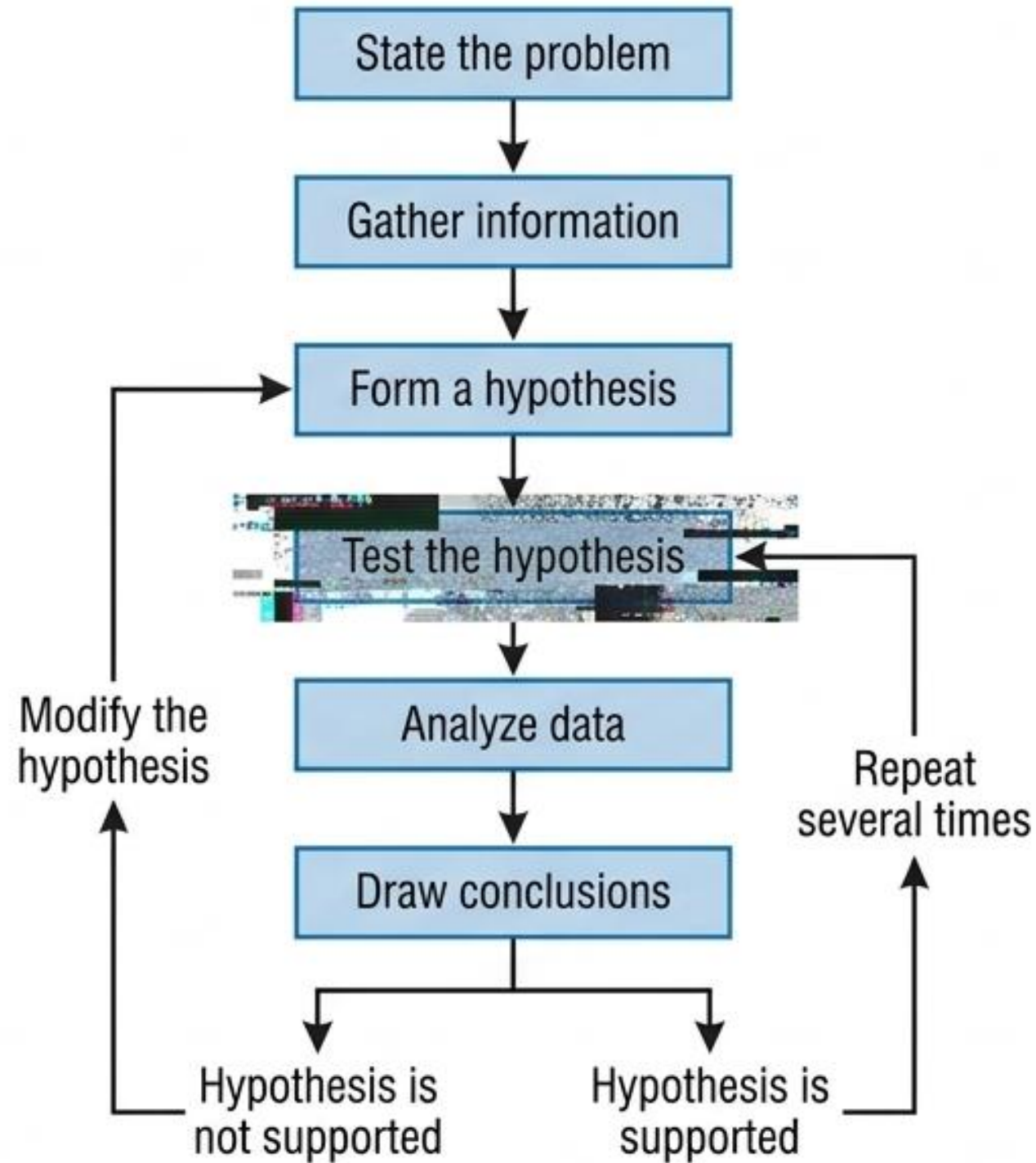


Figure 3 The series of procedures shown here is one way to use scientific methods to solve a problem.

[Recall]

13. Fill in the Blank: The pattern of investigation procedures that scientists follow is called the _____.

[Understanding]

14. Diagram-Based (MCQ): Look at the flowchart. What is the immediate next step after a scientist forms a hypothesis?

- A) Draw conclusions
- B) Analyze data
- C) Test the hypothesis
- D) State the problem

[Analysis]

15. Diagram-Based (True/False): According to the flowchart, if a hypothesis is not supported by the data, the investigation stops entirely.

[Recall]

16. Multiple Choice: The very first step in a scientific investigation—stating the problem—usually takes the form of which types of questions?

- A) “When” or “Where”
- B) “Why” or “How”
- C) “Who” or “What”

[Recall]

17. Fill in the Blank: Before beginning an investigation, scientists research what is already known to gather information. This background helps them fine-tune their question and form a _____.

[Application]

18. Choose the Correct Answer: When early work on guided missiles ran into trouble with instruments in the nose cone, what did scientists do?

- A) They abandoned the experiment.
- B) They posed a new question and changed the problem statement.
- C) They ignored the malfunctioning instruments.

[Understanding]

19. Matching: Match the term to its exact definition:

Terms: 1) Dependent Variable, 2) Independent Variable, 3) Constant, 4) Control

Definitions:

- A) The standard by which the test results can be compared.
- B) A factor that does not change when other variables change.
- C) Changes according to the changes of the independent variable.
- D) The variable that is changed to test the effect on another variable.

[Recall]

20. True or False: An experiment usually contains only one variable.

[Recall]

21. Fill in the Blank: One common way to test a hypothesis is to perform an _____, which tests the effect of one thing on another using a control.

Table 1: Types of Variables

Dependent Variable	
Independent Variable	
Constant	
Control	



[Application]

22. Multiple Choice: In the International Space Station (ISS) experiment studying the effects of microgravity on plant growth, what is the independent variable?

- A) The plant growth
- B) The amount of water
- C) The microgravity
- D) The type of soil

[Application]

23. Choose the Correct Answer: In that same ISS experiment, what is the dependent variable?

- A) The microgravity
- B) The plant growth
- C) The temperature of the station

[Analysis]

24. Multiple Choice: Which of the following is an example of a constant used in the microgravity plant experiments?

- A) The changing gravity levels
- B) The exact same amount of light and water given to each plant
- C) The different types of plants used in each pot

Scientific Theory

Scientific Law

[Recall]

25. True or False: A scientific theory is just a random guess made by a scientist.

[Understanding]

26. Multiple Choice: Which statement best describes a scientific law?

- A) An explanation based on knowledge gained from many observations.
- B) A statement about what happens in nature that seems to be true all the time.
- C) A hypothesis that has not yet been tested.

[Analysis]

27. Choose the Correct Answer: According to the text, can a scientific theory become a scientific law?

- A) Yes, if enough scientists agree on it.
- B) No, theories are used to explain laws, but they do not become laws.



Scientific Method Application & Limitations

[Application]

28. **True or False:** A scientist can use the scientific method to definitively prove whether a piece of art is beautiful or not.

[Recall]

29. **Fill in the Blank:** Science cannot answer all questions. Questions about _____ and _____ cannot be tested and verified scientifically.

[Critical Thinking / Math Connection]

30. **Analysis:** An experiment to determine how many breaths a squirrel takes per minute yields this data: Minute 1: 65 breaths; Minute 2: 73 breaths; Minute 3: 67 breaths; Minute 4: 71 breaths; Minute 5: 62 breaths. Calculate the average number of breaths per minute.

Handwritten calculations for the average number of breaths per minute:

$$\frac{65 + 73 + 67 + 71 + 62}{5} = \frac{338}{5} = 67.6$$

The numbers 65, 73, 67, 71, and 62 are listed, with tally marks below them: IIII, IIII, II, IIII, II. The sum 338 is written above the denominator 5, and the result 67.6 is written below the division line.

End of Assessment.

The Answer Key follows on the next slides. Do not proceed until you have completed all 30 questions in your Science Journal.

Answer Key (Questions 1 - 15)

1.	B	7.	A-iii, B-i, C-ii
2.	X-ii, Y-i, Z-iii	8.	neutrons
3.	False	9.	False
4.	C	10.	A
5.	rules	11.	B
6.	B	12.	True
7.	A-iii, B-i, C-ii	13.	scientific methods
8.	neutrons	14.	C
		15.	False (Modify the hypothesis)

Answer Key (Questions 16 - 30)

16.	B	24.	B
17.	hypothesis	25.	False
18.	B	26.	B
19.	1-C, 2-D, 3-B, 4-A	27.	B
20.	False	28.	False
21.	experiment	29.	opinions, values (either order)
22.	C	30.	67.6 breaths per minute (Calculated as: $[65+73+67+71+62] / 5 = 338 / 5 = 67.6$)
23.	B		
24.	B		



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