

Science zone: The 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: 2026-08-22 13:40:23

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

المزيد من مادة
علوم:

إعداد: رانيا عادل

التواصل الاجتماعي حسب 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

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

1

مراجعة للدروس وفق الهيكل الوزاري الجديد منهج انسباير القسم الموضوعي

2

حل نموذج اختبار تجريبي وفق الهيكل الوزاري القسم الموضوعي منهج بريدج

3

نموذج اختبار تجريبي وفق الهيكل الوزاري القسم الموضوعي منهج بريدج

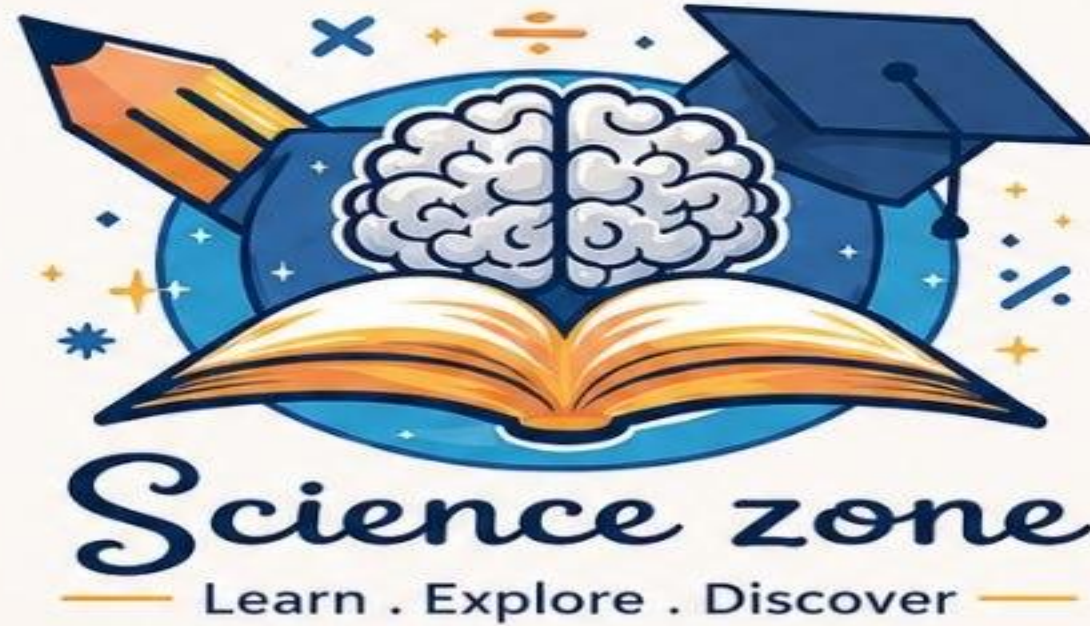
4

حل نموذج اختبار تجريبي وفق الهيكل الوزاري القسم الكتابي منهج بريدج

5

Science zone

الصف الثامن
علوم



الفصل الدراسي الأول
عام 2026-2027

دولة الإمارات
منهج إنسباير



إعداد المعلمة:
رانيا عادل



<https://almanahj.com/ae>



The Methods of Science



How we observe, investigate, and understand the natural world.



What exactly is Science?



Nature follows complex rules, like how the human body works.

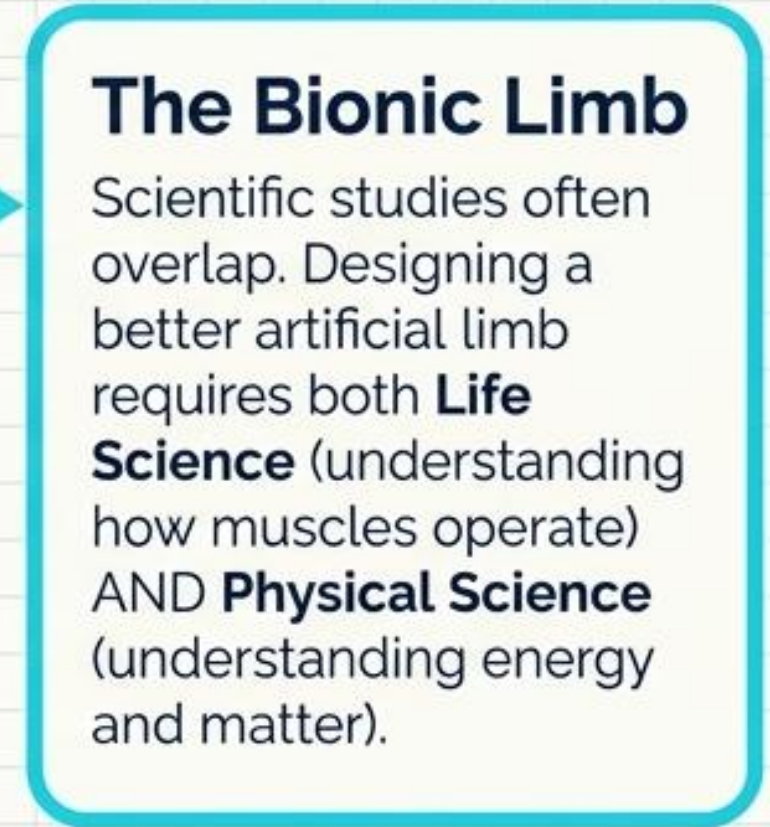
scientia

(Latin for 'knowledge')

Science is a process based on inquiry that helps develop explanations about events in nature.



Nature follows simple rules, like Earth rotating every 24 hours.



Science is Always Changing

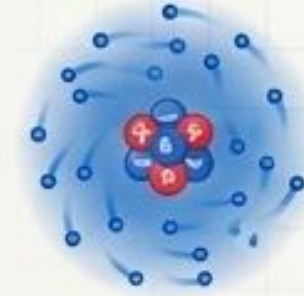
Explanations must be modified when new technology provides more accurate answers.



**1904
Thomson Model**
Electrons embedded in
a solid ball of positive
charge.



**1911
Rutherford Model**
A positively charged
nucleus with electrons
orbiting it like planets.



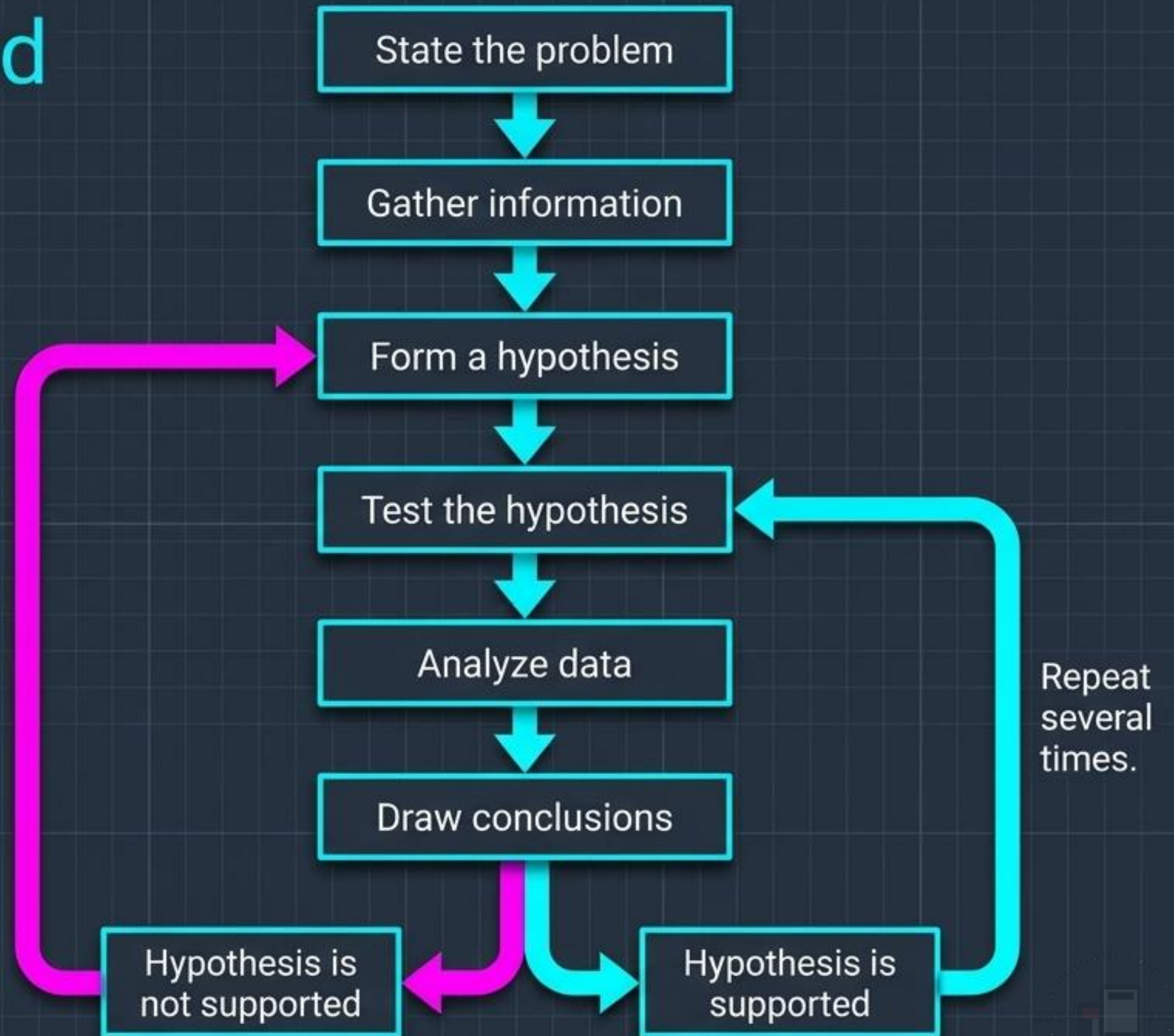
**Present-Day Electron
Cloud Model**
A nucleus of protons and
neutrons surrounded
by a cloud of rapidly
moving electrons.

**Because it is the nature of science to be open to change,
investigations into the atom continue today.**

The Scientific Method

The general pattern of investigation procedures is called the **scientific methods**.

Modify the hypothesis.



Asking Questions & Finding Answers



Example: NASA scientists gathered information on heat shields and hypothesized that a ceramic coating would protect the space shuttle.

Testing the Hypothesis: Variables

An **experiment** tests the effect of one thing on another. A **variable** is a quantity that can have more than a single value.



Independent Variable

The variable changed to test its effect.
(NASA Example: Microgravity environment)



Dependent Variable

Changes according to the independent variable.
(NASA Example: Plant growth rate)

Constant

A factor that does NOT change.
(NASA Example: Same soil, light, water, and temperature for all plants)



Control

The standard by which test results are compared.
(NASA Example: A group of plants grown on Earth under standard conditions)



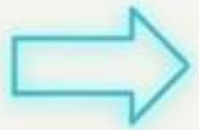
Visualizing with Models

A **model** represents an idea, event, or object to help people better understand it. Used when things are too large, small, fast, slow, or hazardous.



Models in History

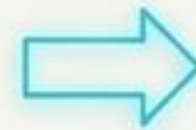
Lord Kelvin in the 1800s put balls into a bowl of jelly to model how light moves through space. Early atomic models also relied on physical representations.



Digital Simulations



Today, computer software mimics processes safely. A flight simulator allows pilots to practice harsh weather conditions without ever leaving the ground.



Drawing Conclusions: Theory vs. Law

Scientific Theory



An explanation based on knowledge gained from many observations and investigations.



It is not a guess.



Can be modified as new information becomes available.

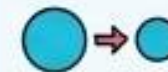


Explains WHY something happens.

Scientific Law



A statement about what happens in nature that seems to be true all the time.



Example: Gravity (one mass will attract another mass).



Does not explain why or how.



Describes WHAT happens.



The Limitations of Science: Science cannot answer questions about opinions or values. You cannot scientifically prove if a piece of art is beautiful.

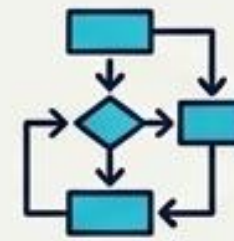


Key Takeaways & Lesson Summary



Science as Inquiry

Science is a process of **inquiry** used to learn about the natural world.



Experimental Variables

The scientific methods take problem
→ Gather info → **Hypothesis** →
Test → Analyze → **Conclude**.



The Scientific Method

Maps the key is mapping underpinnings of framework.

The scientific methods provide a framework: State problem → Gather info → **Hypothesis** → **Test** → Analyze → **Conclude**.

Experiments rely on identifying the **independent** (changed) and **dependent** (measured) variables, while keeping others **constant**.



Visualizing with Models

Models help visualize complex, highly zoomed, fast, slow, or dangerous concepts.



Theory vs. Law

A **Theory** explains **WHY** something happens; a **Law** describes a pattern of **WHAT** happens.

Check Your Progress

Test your understanding directly from the text.

**PRACTICE - NO
ANSWERS PROVIDED**

1. **Define:** Summarize the steps you might use to carry out an investigation using scientific methods.
2. **Explain:** Explain what a law is, what a theory is, and why a theory cannot become a law.
3. **Analyze:** What is the dependent variable in an experiment that shows how the volume of a gas changes with changes in temperature?
4. **Math Connection:** 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.

Challenge Yourself

3 quick questions to test your memory. (Unanswered).



Multiple Choice



Which historical scientist created a model of the atom in 1904 that looked like a solid ball of positive charge with electrons embedded in it?

(A) Lord Kelvin, (B) Ernest Rutherford, (C) J.J. Thomson.

True / False



The **independent variable** is the factor in an experiment that is kept exactly the same for all tests.

Short Answer



Why might an aerospace engineer use a **computer model** to test a **new airplane design** instead of building a real one immediately?



Teacher Rania Adel