



How to teach **SCIENCE**

By: Albakio International

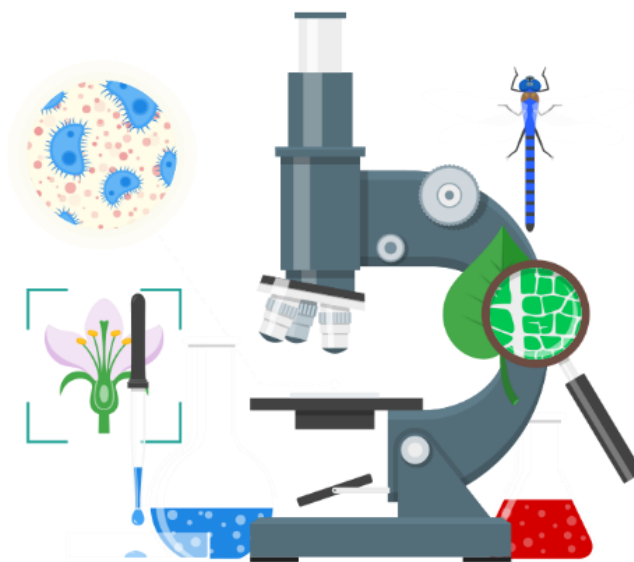


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What is Science?

Science is derived from the Latin word *scientia*, which translates to knowledge. In a formal sense, it is defined as the **intellectual and practical activity** that involves the **systematic study** of the structure and behavior of the physical and natural world through **observation and experiment**.



Beyond a formal definition, science is often viewed as "**Learning by Doing**". It is an active process, a "verb" driven by **raw curiosity** and the desire to explain how the world works. From an instructional perspective, the goal of science is to develop explanations by asking questions, collecting data, and nurturing a mindset that sees challenges as opportunities for growth.

1. How to Start a Lesson (The Lesson Hook)

A lesson **hook** is an introduction designed to grab student attention and create an **eagerness to find out more**. Effective hooks frame student thinking, focus on the concept at hand, and provide context for learning objectives. They are essential for **priming the brain** for learning and establishing a purpose for the lesson.

Six Ways to Start a Lesson:

1. Begin by Showing an Object

The teacher starts the lesson by showing a real object to grab students' attention and connect learning with real life.





Examples:

- **Grade 1:** Show a **leaf** and start a lesson on *plants*.
- **Grade 4:** Show a **magnet** to introduce *force and magnetism*.



2. Begin with a Story

The lesson begins with a short, interesting story that leads students naturally to the science concept.

Examples:

- **Grade 2:** Tell a story about a **raindrop's journey** to introduce *water cycle*.
- **Grade 5:** A story of a child exploring space to start *solar system*.



3. Begin with a Game

A quick, fun game is used to activate prior knowledge and create excitement for learning.

Examples:

- **Grade 3:** Sorting game of **living and non-living things**.
- **Grade 5:** Quiz game matching **organs with their functions**.



4. Begin by Showing a Video

A short video or animation helps students visualize concepts and builds curiosity.

Examples:

- **Grade 1:** Video of **animals and their sounds**.
- **Grade 4:** Video showing **volcanic eruptions** to start *earth processes*.



5. Begin with a Question

The teacher starts by asking a thought-provoking question to encourage thinking and discussion.

Examples:

- **Grade 2:** "Why do we need air to breathe?" (Topic: *Air*)
- **Grade 5:** "What would happen if there were no plants on Earth?" (Topic: *Ecosystem*)



6. Begin with an Experiment

A simple experiment is performed to spark curiosity and help students discover concepts themselves.

Examples:

- **Grade 3:** Mixing water and soil to observe *absorption*.
- **Grade 5:** Growing seeds in light and dark to learn about *photosynthesis*.





Be Smart

1. Theming the Classroom:

Transforming the physical environment to match the lesson topic, such as setting up desks like picnic tables for a "book tasting" event, can be a highly effective way to engage students from the moment they enter.

2. Feely Bags and Boxes:

This sensory technique involves placing objects with distinct textures (soft, rough, cold) or items related to a specific setting (like the beach) into a bag or box for students to describe verbally or in writing.

3. The Museum Walk:

Teachers display posters, data, maps, or interesting props around the room. Students walk through the "museum" in pairs to observe, gather facts, and generate questions for discussion.

4. Discrepant Events:

This involves performing a demonstration that produces a **surprising or counterintuitive result** that challenges students' prior knowledge. The astonishment sparks curiosity and prompts students to ask "how" and "why".

5. Oral Storytelling:

Using the power of narrative to capture imagination, teachers can start with "Once upon a time" to situate scientific concepts within a story. This helps develop scientific attitudes and knowledge by making the content more relatable and memorable.

Some Common Methodologies

1. Lecture Method

A lecture is an arrangement in which teachers share information directly with students. We do not suggest this one as it is one way teaching.

Example: Parts of Plants

The teacher explains the parts of a plant one by one: root, stem, leaves, and flower. The teacher talks about each part's function while pointing at a diagram on the board.

Students listen and memorize the information.


2. Presentations

In contrast to a lecture, most of the information is presented visually, rather than orally.

Example: States of Matter

Slides show ice melting, water flowing, and steam rising.

Students understand changes by watching visual examples.



3. Demonstration

In this format, students witness a real or simulated activity in which you use materials from the real world.

Example: Chemical Reaction

The teacher mixes vinegar and baking soda.
Students observe bubbling and gas formation.

4. Observation

This format allows students to watch an event or occurrence take place first.

Example: Condensation

Students observe water droplets forming on the outside of a cold bottle.
They notice moisture appearing.

5. Brainstorming

Simply defined, it is the generation of lots of ideas (without regard for quality) about a single topic.

Example: Ways to Save Water

Students suggest turning off taps, fixing leaks, and using buckets.
Ideas are collected before discussion.

6. Experimenting

Experimentation involves manipulating data and assessing the results to discover some scientific principle or truth.

Example: Simple Electric Circuits

Students build different circuits using batteries and bulbs.
They test which setup works.

7. Discussions

The class is divided into small groups of two to four students.

Each group is assigned a specific task to accomplish.

Example: Environmental Pollution

Groups discuss causes and effects of pollution.
They propose solutions.

8. Experimenting

In this situation, the class, small groups, or individuals are given a problem or series of problems and are directed to find an appropriate solution.

Example: Which Foods Give More Energy?

Students compare energy effects using food groups (discussion + observation).
They identify energy-giving foods.

9. Roleplaying



In this event, a student (or students) takes on the role of a specific individual (a historical person, for example) and acts out the actions of that person as though he were actually that person.

Example: Electric Circuit

Students act as battery, wires, and bulb.

They show how electricity flows in a closed circuit.

10. Projects

Students are allowed to create their own original designs, models, or structures to illustrate an important point or content fact.

Example: Water Cycle Model

Students create a 3D water cycle model using craft materials.

They show evaporation, condensation, and precipitation.

If you'd like to make every lesson successful, you must do one thing: include A variety of teaching and learning methodologies in every lesson.

2. Six Teaching Techniques



1. Claim, Evidence, Reasoning (CER) Model:

This is a scaffolded framework used to teach the scientific method. Students create an explanation consisting of a **claim** (the answer to a question), **evidence** (data from investigations), and **reasoning** (a scientific principle that connects the evidence to the claim).

2. Mantle of the Expert:

In this drama-based technique, the teacher and students participate in an **imaginative role-play** where the students are treated as **responsible experts** (e.g., scientists at a research center) tasked with solving a specific problem.

3. Drama Techniques (Freeze-frame and Hot-seating):

Teachers can use **Freeze-frames** (still images used to illustrate an event) or **Hot-seating** (where a student or teacher in character answers questions from the class) to explore scientific concepts or the private thoughts of "characters" like animals in a food web.

4. Lab Experiment Formative Assessments:

This technique emphasizes **hands-on exploration** and the practical application of the scientific method. Students use tools like "Slide Drawing" to annotate their findings and diagrams, which helps deepen their understanding of scientific findings.

5. Interactive Technology Quizzes:

Using EdTech tools, teachers can integrate **real-time quizzes** (multiple choice, fill-in-the-blanks) directly into presentations. This provides **instant feedback**, allowing students to correct misunderstandings on the spot.

6. Gamification and Science Trivia:

Transforming the classroom into a game show atmosphere using digital leaderboards and group competitions keeps students motivated. This method is particularly effective for encouraging participation in students who are otherwise quiet.

Analogy for Understanding:

To understand the importance of a lesson hook, think of a **rocket launch**. In order to reach the moon (the learning objective), an **effective and impressive takeoff** is critical to provide the necessary momentum for the entire journey.

3. EVALUATION

This process involves assessing if the SLOs are achieved or not.

You can use the following tools to evaluate the achievement of SLOs;

1. MCQs
2. Short quiz
3. Peer reviewing
4. Presentation by the students



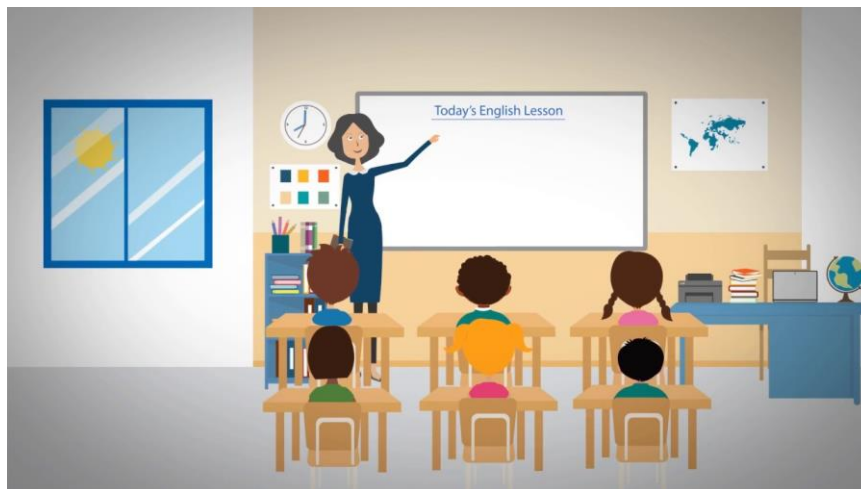
4. HOMEWORK



While giving homework consider the following;

- Give clear and appropriate assignments
- Make homework interesting and doable
- Homework must have a reinforcement of the taught concept
- Keep a regular check and provide constructive feedback
- Ensure clear home/school communication

5. WRAP-UP



Wrap up the lesson using any of the following ways;

- Name one important thing you learned in class today.
- Write one question still in your mind after today's lesson.
- Do you have any suggestions for how today's class could have been improved?

- Which of the pre-class readings you did for class today was most helpful in preparing you for the lessons? Why?
- We had a learning activity in class today. Was this a useful learning activity for you? Why or why not?

- **Creative Closure Activities**

1. Snowstorm:

Students write down what they learned on a piece of scratch paper and wad it up. Given a signal, they throw their paper snowballs in the air. Then each learner picks up a nearby response and reads it aloud.

2. High-Five Hustle:

Ask students to stand up, raise their hands and high-five a peer—their short-term hustle buddy. When there are no hands left, ask a question for them to discuss. Solicit answers. Then play “[Do the Hustle](#)” as a signal for students to raise their hands and high-five a different partner for the next question. (Source: [Gretchen Bridgers](#))

3. Parent Hotline:

Give students an interesting question about the lesson without further discussion. Email their guardians the answer so that the topic can be discussed over dinner.

4. Two-Dollar Summary:

Kids write a two-dollar (or more) summary of the lesson. Each word is worth 10 cents. For extra scaffolding, ask students to include specific words in their statement. (Source: Ann Lewis and Aleta Thompson)

5. Paper Slide:

On paper, small groups sketch and write what they learned. Then team representatives line up and, one at a time, [slide their work under a video camera](#) while quickly summarizing what was learned. The camera doesn’t stop recording until each representative has completed his or her summary.

6. DJ Summary:

Learners write what they learned in the form of a favorite song. Offer extra praise if they sing.

7. Gallery Walk:

On chart paper, small groups of students write and draw what they learned. After the completed works are attached to the classroom walls, others students affix sticky notes to the posters to extend on the ideas, add questions, or offer praise.

8. Sequence It:

Students can quickly create timelines with [Timetoast](#) to represent the sequence of a plot or historical events.

9. Low-Stakes Quiz:





Give a short quiz using technologies like Socrative, GoSoapBox, or google forms, Alternatively, have students write down three quiz questions to ask at the beginning of the next class.



10. Cover It:

Have kids sketch a book cover. The title is the class topic. The author is the student. A short celebrity endorsement or blurb should summarize and articulate the lesson's benefits.

11. Question Stems:

Have students write questions about the lesson on cards, using [question stems framed around Bloom's Taxonomy](#). Have students exchange cards and answer the question they have acquired.

12. So What?

Have students answer this prompt: What takeaways from the lesson will be important to know three years from now? Why?

13. Dramatize It:

Have students dramatize a real-life application of a skill.

14. Beat the Clock:

Ask a question. Give students 10 seconds to confer with peers before you call on a random student to answer. Repeat.

15. Teach a First-Grade Student:

Have kids orally describe a concept, procedure, or skill in terms so simple that a child in first grade would get it.

16. Review It:

Direct kids to raise their hands if they can answer your questions. Classmates agree (thumbs up) or disagree (thumbs down) with the response.

17. CliffsNotes Jr.:

Have kids create a cheat sheet of information that would be useful for a quiz on the day's topic. (Source (PDF): Ann Sipe, "[40 Ways to Leave a Lesson](#)")

18. Students I Learned from the Most:

Kids write notes to peers describing what they learned from them during class discussions.

19. Elevator Pitch:

Ask students to summarize the main idea in under 60 seconds to another student acting as a well-known personality who works in your discipline. After summarizing, students should identify why the famous person might find the idea significant.

20. Simile Me:

Have students complete the following sentence: "The [concept, skill, word] is like _____ because _____."

21. Exit Ticket Folder:



Ask students to write their name, what they learned, and any lingering questions on a blank card or “ticket.” Before **they** leave class, direct them to deposit their exit tickets in a folder or bin labeled either “Got It,” “More Practice, please,” or “I Need Some Help!”—whichever best represents their understanding of the day’s content.

(Source: [Erika Savage](#))

22. Out-the-Door Activity:

After writing down the learning outcome, ask students to take a card, circle one of the following options, and return the card to you before they leave:

- Stop (I’m totally confused.)
- Go (I’m ready to move on.)
- Proceed with caution (I could use some clarification on ____.)

Some More Creative and Optimistic Ways to Close a Class

Outlined below are some of our teacher team’s most creative ways to close a lesson and provide your students with wrap-up activities.

1. Reflective Beach Ball



A fun way to close a lesson is to play a game of Reflective Beach Ball. Purchase a cheap beach ball from the dollar store, and write the following generic reflective questions on the white panels with a permanent marker:

- What are you most proud of from today’s lesson?

- How did you overcome any challenges?
- How did today's lesson make you feel?
- What was one thing you learned from today's lesson?
- What did you find most interesting?
- How did you help others during the lesson?

Ask the students to throw the ball — or, ahem, pass it — around the classroom, ensuring that each student gets a turn with the ball. When a student catches the ball, they read the question out loud then share their answer with the class, before throwing the ball to the next person.

Alternatively, write the questions on a set of popsicle sticks, and place them in a jar. At the end of a lesson, pick a craft stick from the jar and ask the students to share their answers with a partner.

2. Create News “Headlines”

Pair your students off, and tell them to imagine they were writing “headlines” that summarize what they learned. Challenge each pair to write at least two headlines, then come back together to review the headlines.

Alternatively, you can do this as an entire class activity, writing the headlines suggested by students on your whiteboard.

3. Use Exit Tickets

Sometimes students are too scared to ask a question in front of their peers or celebrate a personal achievement, worried that it might make them look silly. A creative lesson closure that can help? Exit tickets. These “tickets” are basically forms kids can fill out with questions



that remain or feedback. By using exit tickets, students are able to let you know of any concerns or successes before they leave the room, and you have an excellent formative assessment to work from.



A student should never leave your classroom with a head full of questions, feeling confused, or feeling deflated. Let them know that even though the lesson is over, there's still room for questions and comments! You could then follow up with the students as a class or individually before or during the next lesson.

4. Sticky Notes Parking Lot

A sticky note parking lot is a great way to close a lesson.

Hand out Post-it type notes at the beginning of the lesson and encourage your students to write down any questions or understandings related to the topic. You can pass out different colors to make it easier: For example, use pink for questions, yellow for almost understanding, and green to explain that they have got it.

At the end of the lesson, students “park” their sticky notes on the parking lot, and the teacher reads out the questions and encourages volunteers who know the answer to share with the class. This allows students to learn from their peers. Achievements from the yellow and green notes are celebrated and discussed as a class.

Using a sticky note parking lot to close a lesson also enables you as a teacher to review and summarize the lesson and consolidate key information with the students.

5. TILT – Today I Learned To

Have you done a TILT with your students yet? This lesson closure helps bring everything together! TILT stands for Today I Learned To.

Use this [Today I Learned To \(TILT\) poster](#) as a whole class or individually to allow students to reflect on what they learned that day. Display the poster in the classroom and refer to it before the next lesson.

Tip: Remind the students what they learned in the previous lesson, and discuss what they will be learning today with a [WALT!](#)

6. Reflective Thinking Prompts

Display our [Reflective Thinking Posters](#) in your classroom as a visual prompt for students to use as they reflect on their own learning.

At the end of a lesson, gather as a class and select a [Reflective Thinking Card](#) to be the reflective focus for the day. Read the prompt to the students and provide them with some quiet thinking time.

Ask for volunteers to share their reflective thoughts with the class and discuss any similarities or differences experienced during the lesson.

7. 3-2-1 Feedback



At the end of a lesson, provide each student with a copy of the [3-2-1 Feedback](#) template.

On the worksheet, students record three things they learned in the lesson, two fun facts, and one question they still have. Ask the students to share their thoughts with a partner.

Encourage students to try and answer each other's questions or suggest ways in which they could find the answer. Alternatively, complete a '3-2-1 Feedback' together as a whole class and ask students to find the answer for homework. At the start of the next lesson, ask the students to share their answers with the class.

8. Quick Rating

If there is only one minute left in the lesson, there is still time for a quick lesson closure. Ask the students to use their fingers to give the lesson a rating out of five, then ask three students to share the reason for their rating with the class.

The rating might be a general rating on the overall lesson, or it may be more specific, such as asking the students to give a rating of how well they understood the concept or a rating of personal improvements.

9. One Word Lesson Closure

One Word is another quick but creative lesson-closing activity that can be used at the end of any lesson.

Before leaving the room, students must think of one word that summarizes the lesson for themselves, then share the word with you before exiting. Their one word may relate to their understanding of the lesson, how they felt about the lesson, a question, or a celebration.

As a follow-up, choose three of the shared words with the whole class at the start of the next lesson.

6. Reflection

At the end of every lesson, the teacher must fill the following table on her lesson plan;

What went good in the lesson?	What can be changed in the lesson?