GED® Science:

Identifying Skills Gaps and Instructional Strategies

Kellie Blair Hardt, Hardt2Heart Adult Education Services

GED TESTING SERVICE®

Kellie Blair Hardt

- Kellie's Story-

- Kellie's Gets a GED Coloring Book-

- GEDTS Board Member-

- GED Math Tutor & Board Member @ GED Testing Service
- 20+ years of middle/high school math/science/special education
- 20+ years of adult adult education, math
- Hardt2Heart Adult Education Services, LLC
- B.A Psychology, M.Ed Special Ed.
- GED Graduate!

*If it's in blue, it's for you!

Session Overview

Beyond the Science Facts

- Busting common misconceptions
- Hidden barriers to learner success
- Why science thinking matters

Small Instructional Shifts

- Adult learning in the science classroom
- Increasing learning confidence
- Teaching strategies that stick

Think Like a Scientist–Not a Memorizer

- Reading science text strategically
- Interpreting graphs, tables and experiments
- Using evidence to support conclusions

From Classroom to Test Day

- High Impact Science Indicators
- Test-taking strategies that stick
- Ready-to-use resources and hands-on practice

Beyond the Science Facts

Changing the goal from memorizing science... to thinking scientifically.

Beyond the Science Facts: Before we begin

When many learners hear

"GED Science,"

they immediately think:

- "I have to remember *everything* I learned in high school science."
- "I don't remember *chemistry*."
- "I hated *biology*."
- "I was never *good* at science."

Beyond the Science Facts: Before we begin

Here's the good news...

The GED® Science test is **NOT** designed to measure how *many science facts* learners have memorized.

It measures whether they *can*...

- *analyze* evidence
- *interpret* data
- *think* critically
- *draw* conclusions
- *read* like a scientist

Beyond the Science Facts :GED Science Text Structure

TESTING TIME

90 minutes

Includes 2 minutes of instructions and final review

No break

FORMAT

Access to *onscreen* calculator

Access to TI-30XS calculator & calculator reference sheet

Multiple choice and other question types (fill in the blank, drag and drop, select an area, and drop down)

PRIMARY FOCUS

Scientific reasoning

Data analysis and interpretation

Application of science concepts

Reading and interpreting scientific texts, graphs, and experiments

Beyond the Science Facts :GED Science Text Structure

LIFE SCIENCE (L) 40%

Human Health and Living Systems

a. Human body and health

b. Organization of life (structure and function of life)

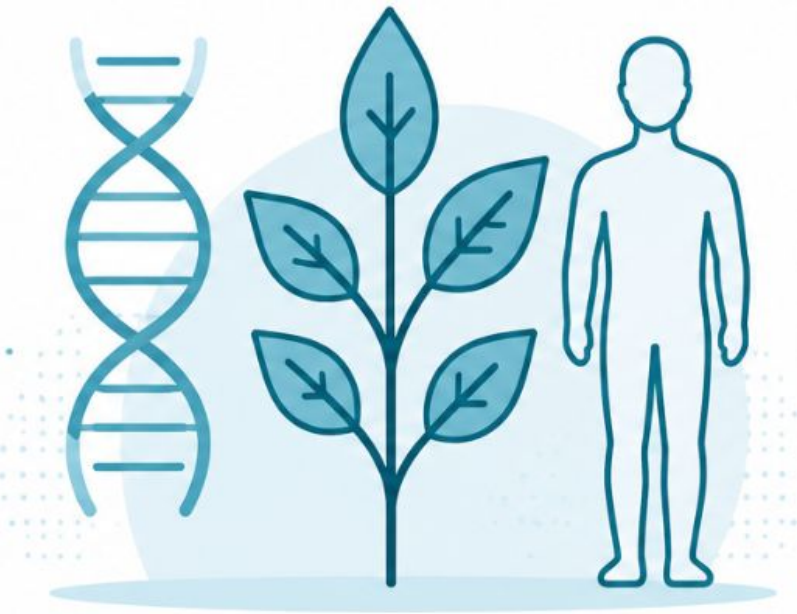
c. Molecular basis for heredity

d. Evolution

Energy and Related Systems

e. Relationships between life functions and energy intake

f. Energy flows in ecologic networks (ecosystems)



Beyond the Science Facts :GED Science Text Structure

PHYSICAL SCIENCE (P) 40%

a. Chemical Properties and Reactions Related to Human Systems

b. Conservation, transformation, and flow of energy

c. Work, motion, and forces

Beyond the Science Facts :GED Science Text Structure

EARTH AND SPACE SCIENCE (ES) 20%

a. Interactions between Earth's systems and living things

b. Earth and its system components and interactions

c. Structure and organization of the cosmos

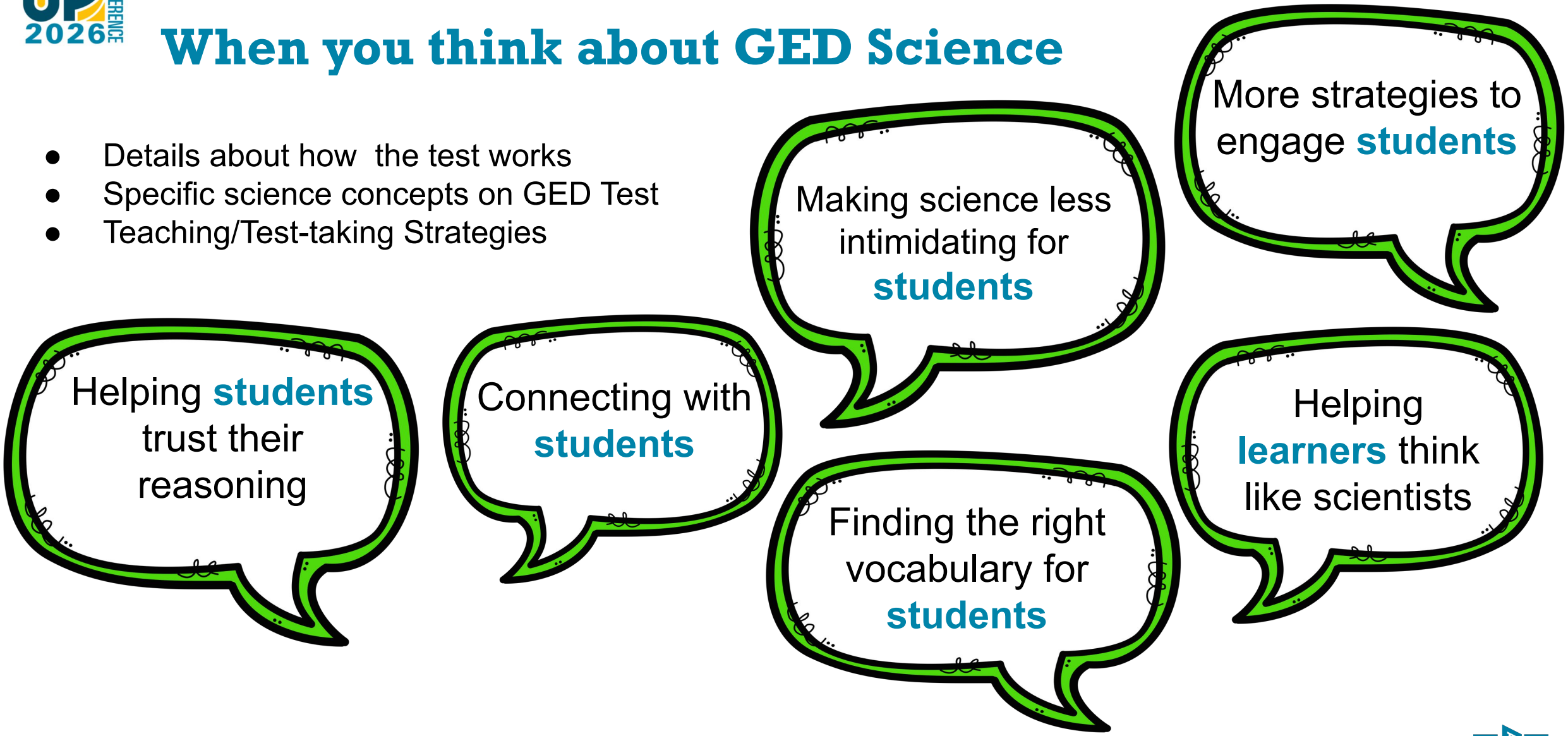
Small Instructional Shifts

Simple changes in teaching that create meaningful learner impact.

Small Instructional Shifts

When you think about GED Science

- Details about how the test works
- Specific science concepts on GED Test
- Teaching/Test-taking Strategies



Small Instructional Shifts

The language we use can either build confidence… or build barriers.

In an andragogic mindset, the term ***student*** is often associated with K–12 environments, where learning is typically teacher-directed and compliance-based.

The term ***learner***, reflects adult education contexts—such as GED programs, workforce training, higher education, and professional learning—where autonomy, experience, and self-direction are central.

Using ***learner*** acknowledges adults as active participants in their own learning rather than passive recipients of instruction.

Small Instructional Shifts

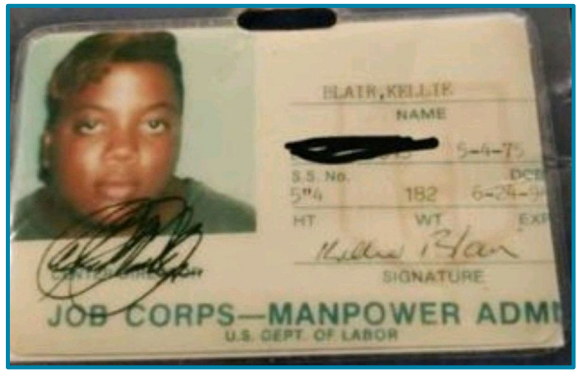
The language we use can either build confidence… or build barriers.

Experience is Everything

Adult learners were once students.

For some, the term ***student*** may carry associations with:

- Past academic failure
- Shame or embarrassment
- Lack of voice or control
- Being labeled, tracked, or underestimated



Because of these experiences, language and actions that echoes K–12 schooling can unintentionally trigger resistance, disengagement, or self-doubt—even when instruction is well-intentioned.

Small Instructional Shifts

Adult Learning Theory in the Science Classroom

Experience

Adults bring rich life and learning experiences that shape how they think, learn, and apply new knowledge. These experiences influence both how adults engage with learning and how they build, adapt, and strengthen skills over time.

Self-Concept

Autonomy & Respect

Adults generally see themselves as independent, self-directing learners. They value having choice, voice, and control over how they engage in learning and how they move through the learning process.

Problem-Centered

Adults are problem-centered rather than content-centered. They are most motivated to learn when instruction is clearly connected to real-life challenges, goals, or tasks. Learning is valued for its applicability, not for mastering content in isolation.

Need To Know

Why & How

Adults need to understand why they are learning something and how it will be used. When learning is connected to current or near-future academic, professional, or personal situations, adults are more likely to engage and invest in developing new skills.

Intrinsic Motivation

Adults are primarily driven by internal motivation. Independence, life experience, evolving social roles, and successful problem-solving build confidence and initiative, increasing willingness to learn and persist through challenges.

Readiness to Learn

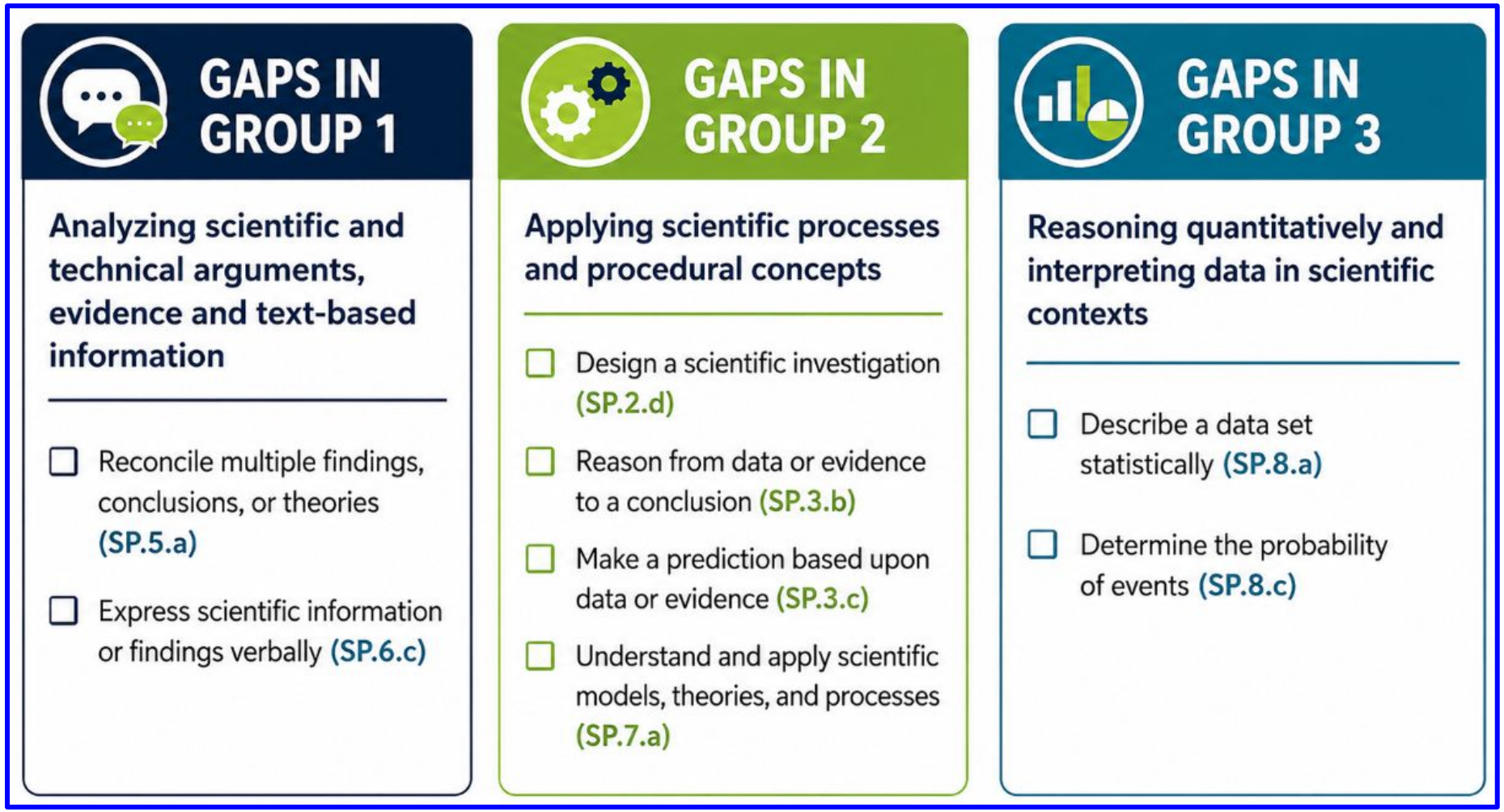
Adults' readiness to learn is closely tied to their social roles and life circumstances, which change over time. Adults tend to learn best when they are psychologically and emotionally ready and when learning connects to immediate needs or responsibilities.

Thinking Like a Scientist- Not a Memorizer

Scientific thinking is a skill—and skills can be taught.

Thinking Like a Scientist….

Where Learners Lose Points



Thinking Like a Scientist....

Where Learners Lose Points

Thinking Like a Scientist....

Where Learners Lose Points

GAPS IN GROUP 1

Analyzing scientific and technical arguments, evidence and text-based information

- ☐ Reconcile multiple findings, conclusions, or theories (SP.5.a)
- ☐ Express scientific information or findings verbally (SP.6.c)

Read Like a Scientist

Learners need support with...

- Understand scientific text
- Compare evidence
- Explain findings
- Interpret investigations

Thinking Like a Scientist….

Where Learners Lose Points

Indicactor:

Items written to assess this indicator should focus on:

- explaining why a particular scientific finding or theory is superior to another
- explaining why/how a set of scientific findings may both be correct

In other words:

"Can you look at messy, sometimes conflicting information… and figure out what makes the most sense—and explain why?"

Thinking Like a Scientist….

Teaching Strategies

Read Like a Scientist

Strategy 1: “Same Topic, Different Take”

Purpose: Build comfort with conflicting information

What teachers do:

Give 2 short blurbs (can be super simple):

Study A: Plants grow faster in sunlight
Study B: Plants grow faster in shade

Teacher Prompt:

- “What’s different?”
- “What could explain BOTH being true?”

What this builds:

- Reconciling findings (SP.5.a)
- Moving away from “one must be wrong” thinking

Have learners physically say:

- “This could be true IF…”
- “This might depend on…”

Thinking Like a Scientist….

Teaching Strategies

Read Like a Scientist

Strategy 2: “Evidence Sort (Hands-On)”

Purpose: Separate claims vs. evidence

What teachers do:

Give:

- 1 claim
- 4–5 pieces of “evidence” (some strong, some moderate,some weak)

Example:

Claim: Exercise improves memory

Evidence cards:

- Study included 120 adults from four cities.
- A few participant reported feeling "more focused.
- Participants exercised three times a week for twelve weeks
- Memory improved by 15%.

Thinking Like a Scientist….

Teaching Strategies

Strategy 2 (cont.): “Evidence Sort (Hands-On)”

Task:

Sort into:

- Strong Evidence
- Moderate Evidence
- Weak Evidence

Why this works:

This builds decision-making—not memorization.

Thinking Like a Scientist….

Teaching Strategies

Strategy 3: “Say It Like You Understand It”

Purpose: Verbal expression (SP.6.c)

What teachers do:

After reading ANY passage:

Ask learners:

“Explain this like you’re talking to your cousin.”

Rules:

- No reading from paper
- No expanded vocabulary unless they can explain them

Optional Sentence Frames:

- “Basically, what this is saying is…”
- “The main idea is…”
- “The evidence shows…”

This is HUGE for confidence + retention.

Thinking Like a Scientist….

Teaching Strategies

Strategy 4: “What Would Make This Wrong?”

Purpose: Critical thinking / deeper analysis

Read a passage of a science investigation (SM steps). After a conclusion is given,

Ask:

“What would have to happen for this to NOT be true?”

This flips their thinking from passive → analytical.

Thinking Like a Scientist….

Teaching Strategies

Strategy 5: “One Question, Three Answers”

Purpose: Reconciling multiple explanations

Present one scientific scenario in which testing was repeated. Ask one question:

Why did the experiment results change?

Provide 3 possible answers.

Learners must:

- Choose the BEST one
- OR explain how 2 could both be true

Reconciling Multiple Findings:
Researchers are studying whether a new fertilizer affects tomato plant growth.
Study 1: Plants receiving the fertilizer grew an average of 4 cm taller than plants that did not.
Study 2: Plants receiving the fertilizer showed no significant difference in height.

Thinking Like a Scientist….

Where Learners Lose Points

GAPS IN GROUP 2

Applying scientific processes and procedural concepts

- ☐ Design a scientific investigation (SP.2.d)
- ☐ Reason from data or evidence to a conclusion (SP.3.b)
- ☐ Make a prediction based upon data or evidence (SP.3.c)
- ☐ Understand and apply scientific models, theories, and processes (SP.7.a)

Think Like a Scientist

Learners need support with…

- ✓ Design investigations
- ✓ Draw conclusions
- ✓ Predict outcomes
- ✓ Apply scientific thinking

Thinking Like a Scientist….

Where Learners Lose Points

Indicactor:

Items written to assess this indicator should focus on:

- identifying the logical order of steps or a missing step of a scientific investigation
- identifying proper tools, appropriate units, or techniques for a scientific experiment
- Evaluating a scientific procedure based on the purpose and/or hypothesis of an investigation

In other words:

"Imagine someone handed you the instructions for baking a cake…

…but the steps were mixed up.

Or one important step was missing.

Could you figure out what comes next?"

Thinking Like a Scientist….

Teaching Strategies

Strategy 1: “What Would You Test?”

Skill: Design an investigation (SP.2.d)

Teacher Move:
Give a real-life simple scenario:

“Plants in one room are growing faster than plants in another room.”

Ask:
“What would YOU test to figure out why?”

Expected responses:

- sunlight
- water
- temperature

Then guide:

- What stays the same? (controlled variables)
- What changes? (independent variable)

Thinking Like a Scientist….

Teaching Strategies

Strategy 2: “What Does the Data SAY (Not You)?”

Skill: Reason from evidence (SP.3.b)

Give a simple table:

Hours Studied	Test Score
1	60
2	70
3	85

Ask:
“What conclusion can we make?”

Then push:
“Show me WHERE you see that.”

This builds evidence-based thinking (not guessing)

Thinking Like a Scientist….

Teaching Strategies

Strategy 3: “What Happens Next?”

Skill: Prediction (SP.3.c)

Using same table:

:

Hours Studied	Test Score
1	60
2	70
3	85

Ask: “If someone studies 4 hours, what do you predict?”

Then ask:
“WHY?”

Forces pattern recognition + justification

Thinking Like a Scientist….

Strategy 4: “Fix the Experiment”

Skill: combo (high impact)

Give a flawed experiment:

“A student tests plant growth using different fertilizers, and various amounts of water.”

Ask:
“What’s wrong with this setup?”

Then ask:

“What’s a better way to setup?” or “What would make the setup even worse?”

Design a scientific investigation -A student writes the following procedure:

1. Place two plants in identical pots.
2. Record the height of each plant after two weeks.
3. Water both plants the same amount each day.
4. Give fertilizer to one plant but not the other.

Which step is out of order?

Thinking Like a Scientist....

Where Learners Lose Points

GAPS IN GROUP 3

Reasoning quantitatively and interpreting data in scientific contexts

- ☐ Describe a data set statistically (SP.8.a)
- ☐ Determine the probability of events (SP.8.c)

Reason With Data

Learners need support with...

- Interpret graphs
- Analyze data
- Describe trends
- Probability

Thinking Like a Scientist….

Where Learners Lose Points

Indicactor:

Items written to assess this indicator should focus on:

- calculating the mean and identifying the median and mode of a given data set
- Items written to assess this indicator should focus on determining the probability of events

In other words:

"Imagine someone hands you a list of test scores.

Your job isn't just to do the math…

Your job is to describe what those numbers are telling you.

That's exactly what this indicator measures."

Thinking Like a Scientist....

Teaching Strategies

Reason With Data

1. Tell the Story Behind the Numbers

Describe a Data Set Statistically (SP.8.a)

Instead of immediately asking learners to calculate the mean, median or mode, ask:

> **"What story do these numbers tell?"**

Encourage learners to observe the data before reaching for the calculator.

2. Estimate Before You Calculate

Describe a Data Set Statistically (SP.8.a)

Ask learners to predict before calculating:

> "About what do you think the average will be?"

This develops number sense and helps learners recognize unreasonable answers.

3. Compare the Three Measures

Describe a Data Set Statistically (SP.8.a)

Rather than teaching mean, median, and mode separately, ask:

> **"Which measure best describes this data set—and why?"**

This shifts the lesson from memorization to reasoning.

Thinking Like a Scientist....

Teaching Strategies

4.. Start with Everyday Likelihood

Determine the Probability of Events (SP.8.c)

Before introducing formulas, ask questions learners already answer every day:

- Which is more likely?
- Which outcome happens more often?
- Which event is impossible?

Build from intuition before introducing probability language.

5. Make Probability Visual

Determine the Probability of Events (SP.8.c)

Use coins, dice, colored counters, or Punnett squares so learners can **see** possible outcomes before calculating them.

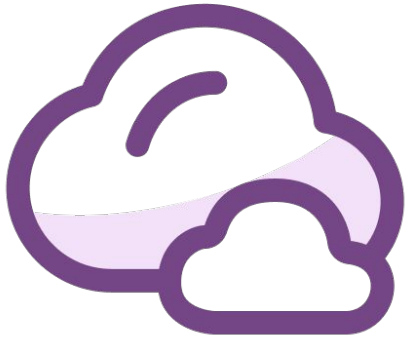
Visual models reduce cognitive overload.

6. Connect Probability to Fractions

Determine the Probability of Events (SP.8.c)

Help learners recognize that probability is simply another application of fractions and ratios.

The math isn't new—the context is.



Someone hands you a list of test scores. Before doing any calculations, what question would you ask first?

From Classroom to Test Day

Turning instruction into confidence, and confidence into higher scores.

From Classroom to Test Day

Test-Taking Strategies for Learners

- **Life Science**
  - You need to know the basics about the human body and health, including body systems, food, disease, and medicine.
  - You need to know how to read about and understand relationships between life and energy, such as photosynthesis and fermentation.
  - You need to know how to interpret information about energy in ecosystems, including food chains and webs, symbiosis, and energy pyramids.
  - You need to be able to understand information about the organization of life, such as cells, cell division, and metabolism.
  - You need to know about heredity, including how traits are inherited and how environment contributes to traits.
  - You need to be able to read about and understand evolution, including adaptation and natural selection.

-Life Science Vocabulary-

From Classroom to Test Day

Test-Taking Strategies for Learners

- **Physical Science**
  - You need to understand energy, including heat, temperature, chemical reactions, types of energy, sources of energy, and waves and light.
  - You need to know about work, motion, and forces, including speed, velocity, acceleration, force, gravity, work, and simple machines.
  - You need to know about chemistry, chemical reactions & balancing equations, and living systems, such as the structure & properties of matter (atoms and molecules), states of matter, density, balancing chemical equations, and solutions.

-Physical Science Vocabulary-

From Classroom to Test Day

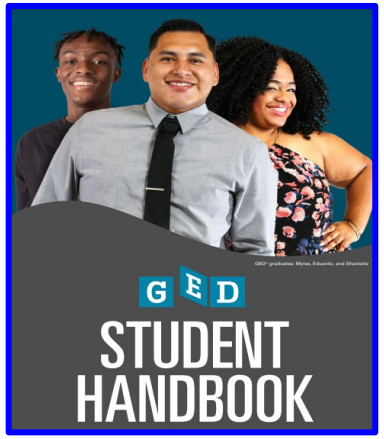
Test-Taking Strategies for Learners

- **Earth and Space Science**
  - You need to know about Earth's systems and how they interact with living things, such as the carbon cycle, the water cycle, natural disasters like earthquakes, and natural resources.
  - You need to understand the Earth and its components, including the atmosphere, the oceans, processes such as erosion, and the structure of the earth (mantle, core, crust).
  - You need to know how to read and understand about the structure and organization of the cosmos, including galaxies, stars, solar systems, the sun, planets, moons, comets, asteroids, and the Earth's history.
  - You need to know the age of the Earth, including fossils, landforms, and dating Earth's rocks

-Earth Science Vocabulary-

From Classroom to Test Day

Test-Taking Strategies for Learners



From Classroom to Test Day

Test-Taking Strategies for Learners

Read Like a Scientist

Strategy 1: "Don't Find THE Answer—Find THE BEST Answer"

Science questions are messy. You are not looking for perfect—you are looking for **most supported**.

Test Move:

- Cross out answers that are:
  - Extreme ("always," "never")
  - Not mentioned
  - Based on opinion

Strategy 2: "Match the Answer to the Evidence—Not Your Opinion"

Do not use outside knowledge or your opinion to answer questions. If it's not in the passage, it doesn't exist.

Quick Strategy:

- Point to where the answer is supported

If you can't point → don't pick it as the answer

From Classroom to Test Day

Test-Taking Strategies for Learners

Read Like a Scientist

Strategy 3: "Both Can Be True"

If two answers seem right…

Ask yourself:

"What changed?"

Look for changes in:

- Conditions
- Groups
- Variables

Those changes are often the clue.

Strategy 4: "Translate Before You Answer"

Before answering a question:

Pause and say:

"What is this question REALLY asking me?"

Example:

"Which conclusion is best supported?" →
"Which answer has the **MOST** evidence.

From Classroom to Test Day

Test-Taking Strategies for Learners

Strategy 5: "Use the 'Because' Test"

If you get stuck:

Add "because…" to every answer choice you have.

If your answer using "because" based on information from the passage doesn't make sense→ it's probably wrong.

Strategy 1: "Follow the Pattern"

If the numbers are going up… expect the answer to go up.

(Simple. Powerful.)

Think Like a Scientist

Read Like a Scientist

From Classroom to Test Day

Test-Taking Strategies for Learners

Think Like a Scientist

Strategy 2: "One Thing Changes"

In a good experiment, only ONE thing changes.

If multiple things change, that's a red flag.

Strategy 3: "Answer = Evidence, Not Opinion"

Point to where in the text you see your answer choice—or don't pick it.

Strategy 4: "Predict = Continue the Trend"

Don't overthink. Just continue what's already happening.

Strategy 5: "Models Tell a Story"

Ask: what is this showing me happening over time or in a process?

From Classroom to Test Day

Test-Taking Strategies for Learners

Reason With Data

1. Read the Question First

Before looking at the numbers, identify what the question is asking for:

✔ Mean

✔ Median

✔ Mode

Don't solve the wrong problem.

2. Watch What the Question Is Asking

Some questions ask for:

- Exactly one outcome
- More than one outcome
- The probability an event **will not** happen

Read carefully before calculating.

3. Ask, "Is My Answer Reasonable?"

Probability should always make sense.

A probability can't be greater than 1 (or 100%), and unlikely events should have smaller probabilities than likely events.

From Classroom to Test Day

Final Thoughts: Don't teach science facts. Teach scientific thinking.

Adult learners don't need to know everything.
They need to know how to think.

Our job isn't to teach every science fact.

Our job is to help learners become confident problem-solvers who can interpret evidence, reason through information, and trust their thinking.

When we teach those habits, we're not just preparing learners for the GED Science test—we're helping them make sense of the world around them.

SESSION SURVEY & THANK YOU!

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session!