Science Literacies

Develop
Hands-on
Words-on
Minds-on

SCIENCE
PARCC emphasizes ideas

Example from PARCC (third grade; PARCConline.org)

Students read one text, “How Animals Live,” then answer these text-based questions.

Part A
What is one main idea of “How Animals Live?”
- a. There are many types of animals on the planet.
- b. Animals need water to live.
- c. There are many ways to sort different animals.*
- d. Animals begin their life cycles in different forms.

Part B
Which sentence from the article best supports the answer to Part A?
- a. “Animals get oxygen from air or water.”
- b. "Animals can be grouped by their traits."*
- c. "Worms are invertebrates.”
- d. "All animals grow and change over time.”
- e. "Almost all animals need water, food, oxygen, and shelter to live."

PARCC notes:
While this is an example of a less complex item—one where the main idea and details to support it are explicit and readily found—students must provide evidence for the accuracy of their answer in Part B, illustrating one of the key shifts: use of textual evidence.

The Common Core Standards Cluster for these two questions:

Specific CCSS alignment to:
- RI.3.1 (evidence).
- RI.3.2 (main idea).
- RI.3.10 (complex text).
So does
Next Generation Science

Concept-Focused Science

CROSS-CUTTING CONCEPTS OF SCIENCE

www.nextgenscience.org/next-generation-science-standards

• Patterns
• Cause and effect
• Mechanism and explanation
• Scale, proportion, and quantity
• Structure and function
• Systems and system models
• Energy and matter: Flows, cycles, and conservation
• Stability and change
**Answer the BIG Question with Cited Examples and Evidence**
CCSSR1—read closely to learn ideas (CCSSR2)

**BIG question:** What is an important idea about ___________________________

*Collect ideas, facts, examples. You can find them in your class notes, from books, articles, and the Internet.*

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<th>What I learned</th>
<th>Where I Found It</th>
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*Write an idea you learned. Support it with examples you found.*

___ an extended response
___ a page in a textbook
___ directions
___ a report
___ an article

__________________________________________ (another format)
Read closely--comprehend, then infer logically.

EXPLORE
Find an animal that looks interesting. What do you like about it?

CLASSIFY
Find two animals that are alike. How are they like each other?

CONTRAST
Find two animals that are very different. How are they different?

ANALYZE, then INFERENCE
- Find an animal that probably moves fast. What helps it move fast?
- Why would it need to move fast? Infer two answers.

SYNTHESIZE
Write a note from one of the animals. Tell how your parts help you live.

Which cross-cutting science concept does this activity develop? __cause and effect __systems __energy and matter __stability and change __structure and function __patterns
Learning Ideas about Animals

CCSSR2. Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas.
Next Generation Science Cross-Cutting Concept: Structure and Function

Animals are wonderful. If you look closely at how they live you will find surprises. Watching animals is a job that scientists do. It is called making observations. They have learned a lot about animals.

Scientists learned about tiny animals. They have studied insects. They found that some insects have tools they use to live. They learned about the sawfly. The sawfly is just one animal they have studied.

Imagine what the sawfly is like. It is a fly but not like many others. They call it the sawfly because it has a kind of saw. It's not a real saw, but it looks like one, and it works like one. It is part of the sawfly. The sawfly uses the saw to make places where the eggs will be safe. It saws at plants to make a place to hide the eggs.

Some insects have tools that work just like scissors. The poppy-bee is one of them. It is a bee that makes its home in wood. This bee has a drilling tool, too. It uses the tool to dig into old wood.

Scientists observe birds to learn about them. They have seen birds use their bills to get what they need. So their bills are like tools. Some birds use their bills to cut into wood. They have sharp bills that can cut a hole in a tree. They drill the hole to get inside the tree where insects live. Then they eat them.

Every animal is amazing. Even dogs and cats can surprise you. The more you look at animals the more you will learn. Nature is full of surprises. Every part of every animal has a purpose. Scientists learn more about them ever day.

EXPLAIN WHAT YOU LEARNED
1. Underline the most important information in each paragraph.
2. Write a short summary that tells what the passage explains. Include only the most important information.

Start your summary this way:
The main idea of the passage is __________________________________________________.
Here is information that helps you understand that idea.
Then finish the summary. Include the information that helps explain the main idea.

Exceed!
Make your report a booklet or exhibit with pictures or diagrams with captions.
**What important ideas did you learn about animals?**  
Collaborative Activity or Independent Assessment

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<th>Idea</th>
<th>Example</th>
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Apply those ideas.  
Invent an animal that lives on another planet.  
It's a warm and watery place.

Explain how it has adapted to live on that planet. Write about the animal. Include each of the ideas you learned to explain how it lives.
I Can Show Colors I Know

Directions: Draw a color in each shape. Then you can cut out the shapes and make them into a matching game.

RED                BLUE          YELLOW
# Check for Understanding: Learning Log

**Content Goal:** I can identify and restate important content. Each day, note the most important words, idea or strategy you learn.

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<td>F</td>
<td>Summarize the week’s learning.</td>
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# PICTURE WORD BANK

Aligns with CCSSR priority: Increase academic vocabulary

**Words about __________________________**

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<th>WORD</th>
<th>Show what it means. Draw a picture.</th>
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Write a sentence with one or two of your words.
Picture a Paragraph
CCSSR2. Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas.

Choose a page to read.

Choose one paragraph that’s interesting.
Every paragraph tells about an idea.

Draw a picture that shows the main idea you learned from the paragraph.

Give your picture and that page number to another student.

See if they can find your paragraph.
Daily Learning Report

Today’s Important Science Learning

What was today’s topic you learned about in science?

___________________________________________________________

List three important ideas you learned about this topic today.

1.

2.

3.

Make up a question about today’s science learning. Another student will answer it tomorrow.
**SMART CHART: CORE VOCABULARY**

Common Core Anchor Reading Standard 4. Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone.

**TOPIC: _________________________________________________**

<table>
<thead>
<tr>
<th>WORD</th>
<th>Show what it means. Draw a picture.</th>
<th>Write a word that tells about your word. It could be an adjective or a word in another language.</th>
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Make the Writing Connection
Use your core vocabulary to write about this topic.
## Share Knowledge: FACT BANK

*This Graphic Organizer can be used to assess if completed independently, or as a learning guide.*

**TOPIC:** ______________________________________

### Important Facts

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Evaluate your facts.
Decide which facts are most important to understanding the topic.
Rank them as most important with 1, important with 2, not important with 3.

### Expand Knowledge

Use your facts to write about this topic to explain it to other students.
Learning Reporter
Common Core Anchor Reading Standard 2. Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas.

Topic: _______________________________________________________

What are 3 important words you need to know to understand this topic?

<table>
<thead>
<tr>
<th>Word</th>
<th>What It Means</th>
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Use a graphic organizer or draw a picture to show what you know about the topic.

Write a summary paragraph about the topic. Include the words you listed. Include ideas and information you show in your picture or graphic organizer.
Science Writer
CCSSR2. Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas.
CCSSW2. Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.

Topic: __________________________________________________________

What are some important words to know to understand this topic?

<table>
<thead>
<tr>
<th>Word</th>
<th>What It Means</th>
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What’s important to know about this science topic?

________________________________________________________________
________________________________________________________________
________________________________________________________________
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________________________________________________________________
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THIS WEEK’S SCIENCE LEARNING SUMMARY

CCSSR2. Determine **central ideas or themes** of a text and analyze their development; **summarize** the key supporting details and ideas.

**TOPIC:** ____________________________________________________

*What are five words that are important to understanding this topic?*

<table>
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<th>Word</th>
<th>What It Means</th>
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*What are the most important facts and ideas you learned about it? List them here.*

______________________________________________________________

______________________________________________________________

______________________________________________________________

______________________________________________________________

______________________________________________________________

______________________________________________________________

______________________________________________________________

*Write a Summary*

Use your facts and words to write about one important idea.
Show Relationships
Set up Science Word/Idea Connection Exhibits—ask students to add words and illustrations and then to write a summary with these words.

Examples of Science Vocabulary Word Walls

Scientific Method

- hypothesis
- experiment
- variable
- estimate
- conclusion
- data

ecosystem

- balance
- adaptation
- interdependence
- food chain
- food web
- water cycle
Scientists Follow Rules for the Safe Science Lab

<table>
<thead>
<tr>
<th>Safe Practice</th>
<th>Why?</th>
<th>What could happen if you don’t follow this practice?</th>
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I can Synthesize Science

CCSSR7. Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words.

Topic: _________________________________

Important Words

<table>
<thead>
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<th>Word</th>
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<tr>
<td>Picture</td>
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Important Information

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Show or write about the topic here.

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I Can Analyze Causes and Effect
This Graphic Organizer can be used to assess if completed independently, or as a learning guide.

Complete this diagram about a science situation.

Situation: __________________________________________________________

In the boxes write two different causes of an important change or action. In the diamond write the important change or effect of those causes.

Summarize what your diagram shows.
Analyze Science Arguments

CCSS R8: Delineate and evaluate the argument and specific claims in a text, including the validity of the reasoning and sufficiency of the evidence.

CCSS Writing Standard 1: Write arguments to support claims in an analysis of substantive topics or texts using valid reasoning and relevant and sufficient evidence.

**Issue:**

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<thead>
<tr>
<th>One Position</th>
<th>Another Position</th>
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<tr>
<td>Supporting Reasons and Facts:</td>
<td>Supporting Reasons and Facts:</td>
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Which writer gives stronger support? Support your answer by analyzing the kinds of ideas, information, and examples each one gives.