

Workbook for

# Teaching Children to Ask Meaningful Questions

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**Please do not read this workbook in advance of the workshop. We want you to discover the process as we go.**

**Please print this out in advance and bring it with you.**

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Yes or No questions often start with these words:

Is it

Will it

Will

Does

Do

Is

Are

Can

## Finish the Question & 20 Question Game

Break into pairs

One learner says “Is it” ...

Partner says a word or words to create a complete sentence in question form.

Take turns and see if finished questions can be generated faster.

Now take turns with each learner doing both parts.

Get faster: build fluency!

Next, play the 20 questions game, but restrict *it* to person, place or thing in the room.

Ask one learner to think of a person place or thing.

Have the other ask a question to first identify if it is a person, place or thing. Keep asking until the learner finds out what *it* is. The learner who picked *it*, must answer with only “Yes” or “No” answers.

Now switch roles and do the same exercise.

Once they find out what it is –person, place or thing:

Have them keep asking and answering questions to find out exactly what it is the first learner is thinking about.

Tell them to see if they can find the answer in twenty questions or fewer.

## Exercise 1

A good question should:

1. be a complete sentence that clearly states what it is asking about;
2. create a discrepancy or present a problem to solve;
3. be related to the occasion for the question.

For a question about text, the question asks about material one is preparing to read or examine, but has not yet read or examined. That is, it creates a problem that can only be solved by reading the upcoming text.

How many questions can you generate in one minute? Write one question for each topic that follows.

Suggested question starters: Why, Where, List, Describe, How.

## Questioning Fluency-Building

Use for both see/write & see/say timed practice

1. Scientists eye the X-ray universe
2. Researchers search for drugs with stroke risk for elderly
3. Geologists investigate the process by which mobile oxygens make silica magma flow
4. African find moves ancient apes southward
5. Do some SIDS victims actually suffocate?
6. The Great Barrier Reef
7. Record breaking brightness poses enigma
8. Hormone-blockers may yield male 'Pill'

9. Glitches bump ROSAT off the fast track

10. Cyclic weight gain may harm the heart

11. Scientists think U.S. skies harbor ozone destroyer

12. Water storage important for desert operations

13. Grapefruit juice thought to give drug an added punch

14. Laboratory accident leads to telephone's first use

15. Two reports take aim at asthma jeopardy

16. Helium theory gets high-precision test

17. President's budget: Rosy outlook for R&D

18. Gauging the Winds of War: Anthropologists use new technique in seeking the roots of human conflict

19. Holes in the ground suspected hold untapped climate riches

20. Suicidal seniors: Deadly serious

21. Schizophrenia genesis: the origins of madness

22. Quasar clumps dim cosmological theory

23. Heavenly bodies make their UV film debut

24. How do ultrasounds reveal sickle-cell stroke risk?

25. Climate test: Hum heard 'round the world

26. Investigators believe beverages intoxicated by lead in crystal

27. Fiftieth search honors student scientists

28. Doctors announce antibody treatment regimen for AIDS

29. Science and clinical tradition clash amid new insights into depression

30. How proteins guide early heart development?

31. Brain neurons blamed for dizzy spells

32. The process by which a supernova yields a cosmic yardstick

33. Researchers develop a lab technique for snatching order out of chaos

34. The self-management method



35. An important job at the Jaxon Corporation

36. Unexpected leakage through landfill liners

37. What transpired at the Berlin wall?

38. Rhinovirus receptor found: colds carry on

39. Making new materials molecule by molecule

40. More cervical cancer in passive smokers

41. Mutation revealed for adult Tay-Sachs

42. Window on the chemistry of cracking glass

43. Iron and Industry: Ancient Links

## Exercise 2

Do not read the article

Listen for further direction

Generate a question for each paragraph.

You may combine your questions into one or two summary questions.  
Make sure all elements of each question are present.

Answer your questions. (You still have *not* read the article.)

Read the Article

Underline where you matched the text.

Circle discrepancies and note the differences.

Now answer your questions again. (You now have read the article.)

Write questions here:

—WENDY MARSTON

## Five Million Years of Solitude

*Deep in a Romanian cave,  
an improbable pocket of life*

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**F**IRST YOU MUST RAPPEL DOWN A ROPE through a rocky pit into a dark cavern, sixty feet below the Black Sea coast of southern Romania. Then, aided by a powerful miner's light, you can walk upright for a thousand feet through a warm, dry cave passage. Finally the passage narrows, leaving only one forward route: a dive. Donning complete scuba gear, you must swim under the surface of the lukewarm, standing water, then wriggle through a tight passage into a channel. In the channel you will find a few inches of space above the still surface of the subterranean lake, but you'll still need the scuba gear. There is little oxygen in the air. Welcome to Movile Cave. Look around. Play the light over the walls. After five million years of isolation, the inhabitants of the cave are finally getting some visitors.

The isolation of Movile Cave—the Galápagos Islands of underground habitats—has been virtually complete. Without a natural entrance, no surface life could gain access, and clay on its walls and ceiling kept the surface water out. In its coffinlike, lightless environment, warm volcanic waters, rich in highly toxic hydrogen sulfide, percolated up through fissures in the rock floor. The hydrogen sulfide in the water reacted with oxygen in the air to form sulfuric acid, which etched away at the limestone, enlarging the cave and depositing gypsum on the walls.

In 1986, during the exploratory construction of a power plant, the nearly flooded cavern came to the attention of the modern world. Romanian cave divers were the first to explore its nether regions, and as they explored, they came upon the spaces between the water's surface and the ceiling of the cave, which turned out to be not only poor in oxygen but also rich in carbon dioxide. The divers would poke their heads up into the "air bells," and, ac-

Write questions  
here:

According to the biologist Thomas C. Kane of the University of Cincinnati, they would “find themselves staring at all these strange insects crawling about on the walls.” In all, forty-eight life-forms—both on land and under water—were discovered flourishing in the strange and self-contained ecosystem; thirty of them biologists had never seen before.

#### Trading Acid for Sunlight

FOR BIOLOGISTS THE LURE OF MOVILE Cave is the rich complexity of the ecosystem in spite of its lack of sunlight and its scarcity of oxygen. At the base of the cave's food chain are bacteria that can synthesize organic molecules from the carbon dioxide in the air and the energy derived from the sulfuric acid reaction. Thus instead of depending on sunlight for energy, the ecosystem of Movile Cave relies on chemical energy. The bacteria grow along with fungi into white mats, which gently ride the surface of the lake, kept afloat by methane-gas bubbles, or cling to the rock walls in the air bells. All other life within the cave depends on the microbial mats.

After millions of years in the dark and toxic environment, the creatures of Movile Cave have lost both pigmentation and sight. Some retain empty eye sockets, but they have developed elongate legs and antennae to feel their way about in the dark. Many also have novel ways of warding off the destructive properties of hydrogen sulfide and sulfuric acid. The water scorpion, for instance, is covered with a thick layer of sulfur-loving bacteria, which biologists think protects the scorpion from the toxicity of hydrogen sulfide.

Biologists divide the life of Movile Cave into two groups: the aquatic animals and the terrestrial animals; the latter make their homes on the limestone walls around air bells. In each region are plant eaters, which peacefully graze on the microbial mats, and meat eaters, which prey on the plant eaters and on one another. The aquatic community lives just below the water surface—no more than two inches down—and includes a variety of swimming flatworms, roundworms, microscopic roundworms and snails, as well as isopods, insects and shrimplike crustaceans, none of which grow longer than half an inch. Three meat-eating species also live in the water: a flatworm with a triangular head, which feeds on the crustaceans; a reddish brown blind leech, colored by the hemoglobin in its blood, which eats the flatworms; and the water scorpion, which eats virtually anything.

On the walls are spiders, pseudoscorpions, millipedes, beetles and more isopods. Many of the smaller animals feed on the wall and floating mats. The top predator of the terrestrial environment is a centipede, which feeds on the mat eaters.

Because of the isolation of the cave, the microorganisms and animals have little

similarity to the aboveground ecology of Romania. Many of them—particularly the terrestrial creatures—are relics of a period when the climate was tropical, more than five million years ago. The Movile Cave spider, *Lasona cristiani*, for instance, is most closely related to spiders living on the Canary Islands and in northern Africa.

To study the ecosystem further without damaging it, investigators will pump water out of the cave to a laboratory above ground. There they will recreate the cave environment while leaving the subterranean world undisturbed.

—ROBERT ZIMMERMAN  
AND WENDY MARSTON

With the article unread, write your answers to your questions here.

With the article read and discrepancies noted, write your answers to your questions here.

### **Exercise 3.**

Write your questions for the video here:

## Resources

Robbins, J. K. (2011). Problem solving, reasoning, and analytical thinking in a classroom environment, *The Behavior Analyst Today*, 12 (1), 40–47.

*Learn to Reason with TAPS: A Talk Aloud Problem Solving Approach*. Write to: joanne@peerinternational.org

*A Case of Red Herrings: Solving Mysteries through Critical Questioning*  
Thomas Camilli, *Critical Thinking Books & Software* (1992)

*Puzzle Them First! Motivating Adolescent Readers with Question-Finding*  
A. Vincent Ciardello (2007) *International Reading Association*

*Cognitive Exercises for Language Intervention Verbal Reasoning Activities for Adolescents and Adults*, Joel Lawrence, Academic Communication Associates (1991)

*Text and Lessons for Content-Area Reading*

Harvey “Smokey” Daniels and Nancy Steineke (2011) Heinemann Publishing

Zoobooks, San Diego, CA

*20 Questions Electronic Handheld Travel Game*, 20Q Radica

*Mr. Potato Head Find Me!*, Hasbro Talking Electronic Game

*Question Cubes: Who What Where When*, Teacher Created Resources  
([www.teachercreated.com](http://www.teachercreated.com))