Dear Educator:

Welcome to a new school year! We've got lots of great places and ideas to explore this year. In the September issue of EXTREME EXPLORER, you and your students will travel to hot spots to learn about geckos, climb Mount Everest to see how altitude affects the human body, and go to Mars to find out what scientists are doing to try to find out if life exists, or existed, on the red planet. After reading the issue, use the **Comprehension Check** (p. T23) to help your students review their understanding of the stories.

With the start of a new school year, we also are including some new features in our Teacher's Guide. On p. T2, get ideas on how to create an **Academic Word Wall** and to help your students start their own **Academic Vocabulary Logs.** You and your students will be able to add to these all year long, each time you get your new issue of EXTREME EXPLORER. We hope these tools, and accompanying activity ideas, will help your students take ownership of their growing vocabulary.

In addition, in this issue only, we've added a special activity master geared towards helping students understand how to read a non-fiction magazine. The **"Know Your Magazine"** activity (p. T14) gives students an opportunity to figure out such text features as glossaries, captions, and more. They'll learn how to navigate the issue and know what to expect each month.

Of course, you know what to expect: great photos and terrific stories. Don't forget to check out our free whiteboard content, too, by clicking the whiteboard link on the EXTREME website. Now let the exploring begin!

Macon Morehouse
Editor, EXTREME EXPLORER

Gecko Power!, pp. 2-9

Curriculum: Standards

- Life Science: Adaptation; anatomy
- Language Arts: Use visualization to deepen understanding

Literacy Skills

- Comprehension Strategy: Visualize
- Content Literacy: Read a diagram
- Vocabulary: Develop academic vocabulary
- Extend the Learning: Critical thinking

Trek to the Top, pp. 10-17

Curriculum: Standards

- Geography: Physical and human characteristics of a place; altitude; land formations
- Health: Human body systems
- Language Arts: Use of pre-reading strategies

Literacy Skills

- Comprehension Strategy: Set a purpose for reading
- Content Literacy: Read a chart
- Vocabulary: Develop academic vocabulary; descriptive language
- Writing: Autobiography

Life on Mars?, pp. 18-23

Curriculum: Standards

- Space Science: Our solar system; advance scientific understanding through comparisons
- Technology: Space exploration
- Language Arts: Ask questions to self-monitor reading comprehension

Literacy Skills

- Comprehension Strategy: Ask questions
- Vocabulary: Develop academic vocabulary
- Math: Word problems
- Writing: Science fiction

What's New at EXTREME EXPLORER?

As you begin a new school year, we would like to include some ideas and tools that will enhance your students' learning as they read NATIONAL GEOGRAPHIC EXTREME EXPLORER. We hope you find these useful to your students.

Academic Word Wall

To supplement your students' learning of content words, designate an area in the classroom to post new **Academic Vocabulary.** Throughout the year, add content words from each issue of NATIONAL GEOGRAPHIC EXTREME EXPLORER to the word wall. Activities using the Word Wall could include:

- Call out the definition of a word and students must say or write the correct word. Reverse the activity by calling out a word and having students write down its meaning.
- Select three to five words for students to illustrate. Students also can work in pairs taking turns giving words from the Word Wall to each other to illustrate.
- As more words appear on the wall, give students different ways to sort the words such as by topic (space, animals, or plants), or reinforce language arts with word sorts of nouns and verbs, suffixes, prefixes, or syllables.

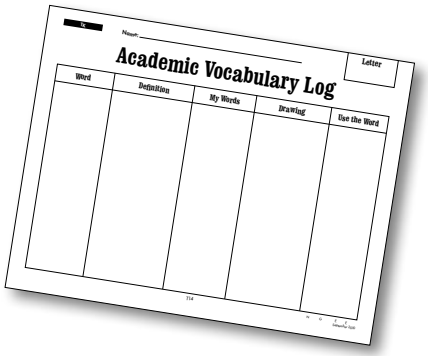
Academic Vocabulary Log

As your students read the stories this year in NATIONAL GEOGRAPHIC EXTREME EXPLORER, they will be exposed to new academic vocabulary. To ensure students have the necessary background knowledge to understand each story, we will provide a short academic vocabulary lesson in each Teacher's Guide. Encourage students to start an *Academic Vocabulary Log* that they can add to each month. Focus on the words listed in Wordwise at the end of each story. You also may want to include other new or unfamiliar words from the text.

The *Academic Vocabulary Log* can be set up in a number of ways. (See one example, below.) Ideally, each page would represent one word so that students can sort them into ABC order, with the first letter of the word in the top, right-hand corner. They should be able to bind the logs in such a way that they can add pages (using a hole-punch and ribbon, for example). Explain to students what to include while modeling the process. For example:

- *Word*: Write a word in the first column as determined by the teacher or individual students.
- *Definition*: Write a short definition from Wordwise or a dictionary for the word.
- *My Own Words*: Ask students to write a few words or "hints" to help them remember what the word means.
- *Drawing*: Illustrate the word or create a symbol that can be associated with the word.
- *Use*: Write a sentence that shows how the word is used.

Watch for activities in future issues utilizing the words accumulating in the students' *Academic Vocabulary Logs!*



Gecko Power!

About the Story

What animal can grip almost any surface, climb upside down, soar through the air, and more? The gecko! Readers will find out how this lizard is built to survive in a world full of danger. The story traces the existence of geckos from 200 million years ago to today, showing many of the ways geckos have adapted their behavior, looks, and even internal structures in order to become one of nature's super survivors.

Before Reading

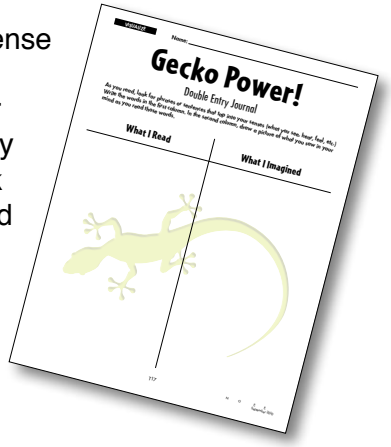
Preview and Make Connections Display the words *gecko (lizard)* in the center of a content web. Explain that a gecko is a kind of lizard. Have students turn to a partner and discuss everything they know about lizards in one minute. Ask students for responses and display key words and concepts. Tell students they will be able to add to the web as they discover new information in the story.

Next, have students preview the article's pictures, captions, and headings. Say: *As you preview the story, make connections with what you already know about geckos to help you think about what you are going to read. Write down three things you want to find out about geckos in the story.* Ask volunteers to share their questions. Display the questions next to the content web.

Comprehension Strategy

Visualize Explain to students that some articles are filled with sensory images. Tell them that they will be able to use the author's words to create pictures in their minds. Say: *Visualizing is like turning a story into a photo album or movie. You can use your own experiences and the author's descriptive words to "see" what is happening in the story.* As an example, read aloud this sentence on p. 4: "It's green and brown skin makes it look like the bark, so it's hard to see." Invite students to share what they saw in their mind as you read that sentence.

Further explain that while sight may be the first sense we use when reading, students should look for descriptions that make them hear, touch, taste, or smell the subject. Then distribute the Double Entry Journal activity master (p. T16). As they read, ask students to record any sensory passages they find in the story. Then ask them to draw, describe, or act out what the description made them "see". When finished, ask volunteers to share the most vivid images they found in the story.



This fantastic leaftailed gecko uses camouflage to help it stay safe.

Darkness falls in a rain forest. A gecko flattens its body against a mossy tree branch. Its sticky feet grip the tree tightly. Its green and brown skin makes it look like the bark, so it's hard to see. Is that enough to keep it safe? Not tonight.

A sharp-eyed bird tries to snatch the gecko. It flips backward away from the tree. It twists its body in mid-air and lands on its feet. Is it safe now? Not yet.

A cat-eyed snake strikes. The snake sinks its teeth into the gecko's tail. This gecko has run out of luck. Or has it?

It's got another escape plan. The gecko quickly detaches its tail. The tail twitches and distracts the snake. Using its night vision, the rest of the gecko races off into the dark.

The gecko may be small. Yet it has wild ways to survive in a world full of danger.

Built for Survival

Geckos have lived on Earth for at least 200 million years. They lived with—and outlasted—dinosaurs. They toughed out extreme changes in Earth's climate, too.

To survive, geckos adapted, or changed over time. Some grew skin flaps so they could glide through the air. A leaf-tailed gecko's tail looks like, well, a leaf. That helps it hide from predators.

Then there are the sticky feet. This **adaptation** has been around for a long time. A recent **fossil** find shows what a gecko foot looked like 100 million years ago. The foot was preserved in amber, or fossilized tree sap. It looks a lot like the feet of modern geckos. This proves geckos really stuck with sticky feet!

toughed out: survived

Fitting In

Scientists think those early geckos lived in damp, tropical forests. Today, you can find geckos in rain forests and many other warm **habitats,** too. They can live in deserts, jungles, and even cities.

Like all **reptiles,** geckos are cold-blooded. They need the sun or other heat to warm their bodies, and the shade to cool them.

No matter where a gecko lives, it faces danger. Check out four of the gecko's super survival skills.

The Gecko Grip

Many geckos can race up a rough tree, over smooth glass, or upside down across a ceiling. A gecko's grip even can work under water. What lets it stick to most surfaces?

The answer is in its toes. A gecko's toes are wide and flat. Scientists think they once were covered by slippery scales. Now each toepad is covered with thousands of tiny "hairs" called setae. The tip of each hair splits into even smaller hairs. The end of each smaller hair is shaped like a spoon.

These ends let the gecko hold on to just about any surface in millions of spots. To get unstuck, the gecko peels its toes up. It's super quick. A running gecko might attach and detach its toes 30 times a second.

Not all gecko feet look the same. Yet most gecko species have microscopic sticky "hairs" on their toes. Get an up-close look (left).

Academic Vocabulary

Have students create an Academic Vocabulary Log to use throughout the year (see p. T2 for directions). Display the words: **adaptation, fossil, habitat, pupil,** and **reptile.** Invite students to define them in their own words, then compare the definitions they came up with to the ones in Wordwise (p. 7).

Next, use the Think-Pair-Share cooperative learning strategy to have students come up with examples of how to use each word. Say: *The definition for habitat says it's a "place where an animal lives." An example could be "A whale shares its habitat with a lot of fish."* Tell students they have five minutes to come up with examples for each word. Ask volunteers to read their sentences aloud. Ask the other students to listen closely and give a thumbs up if they think the word was used correctly.

Explore Science

Explain to students that geckos have adaptations that help them survive. Over time they have adapted in ways that help them escape predators. If needed, remind them of the definition for *adaptation.*

Then divide the class into three groups. Assign each group one of the following sections: the introduction (first column, p. 4), "Built for Survival" (p. 4), and "The Gecko Grip" (p. 5). Have students read their section to themselves, then, as a group, write down which gecko features they read about that are key to the animal's survival—and how these features help the gecko. (Note: There will be some overlap.)

Then have students from each group share orally what they learned. Using the content web, display key features as they are mentioned. Point out that these features and behaviors evolved over time.

Fast Facts

- The word gecko comes from Javanese, ge'kok. Their name imitates the sounds they produce.
- There are nearly 2,000 gecko species. Geckos have been found on all continents except one: Antarctica.
- The only substance found so far that a gecko cannot stick to is Teflon.
- Some gecko species can shed their skin to escape a predator. They can lose large chunks of skin and still survive.

Comprehension Quick Check

What important adaptations have geckos made over time?
(Examples: Toes that stick, super night vision, skin flaps that let them glide, bodies that look like bark or leaves, a detachable tail.)

Terrific Tail

A gecko's toes can help it get out of sticky spots. So can its tail. Scientists recently filmed a flat-tailed gecko climbing a wall. They replayed the video at a slow speed. At one point, one of the gecko's feet slipped. It started to fall backward.

Then the scientists saw something surprising. The gecko flattened its tail against the wall, using it like a fifth leg. This helped the gecko get its balance back.

A gecko can use its tail to fool predators, too. It has a weak spot in the bones of its tail. When something grabs its tail, the gecko can squeeze muscles at the weak spot. The tail breaks off! A predator only gets a mouthful of tail. This mini-meal distracts it. The gecko gets away.

Luckily, a gecko can regrow its tail in a few months. The new tail is not as long or strong, though.

sticky spots: danger

Night Sight

So it's good that many geckos have yet another adaptation that helps keep them safe. This one has to do with their eyes.

Scientists think that geckos used to be mostly active during the day. Most lizards are. Then geckos became nocturnal, or active at night. It's hard to see at night. How could these geckos spot danger?

Their eyes changed. Over time, geckos' **pupils** became bigger. A bigger pupil can let in more light at night. That helps them see more clearly.

Color-sensing parts deep in the eye got bigger, too. That lets nocturnal geckos see some colors in the dark. That's unusual. Most animals only see in black and white at night. What super night sight!

Some geckos later readapted to daytime living. During the day, there's plenty of light. So these geckos' eyes changed again. The parts of their eyes used to catch light got smaller.

During the day, this nocturnal tokay gecko closes its pupils. That protects its eyes.

Many geckos can't blink to protect their eyes. This one uses its tongue to lick dust out of its eye.

Listen Up

A gecko's grip, terrific tail, and night sight all help keep it alive. If worse comes to worse, though, many geckos have one more survival skill. They make noise to scare off predators. In fact, they are the only lizards with voices.

Some bark. Others squeak, hiss, or croak. The African whistling gecko—you guessed it—whistles. It's not musical, though. It's deafening! Geckos also use their voices to find mates and communicate with one another.

Think of all the ways the gecko has adapted to life in a world of danger. From head to tail, the gecko is built to survive.

What gecko power would you like to have? How would you use it?

WORDWISE

adaptation: behavior or body part that helps an animal survive

fossil: remains of something that lived long ago

habitat: place where an animal lives

pupil: opening in the center of the eye that lets light in

reptile: cold-blooded animal that slithers or crawls on its belly

6 National Geographic Extreme Explorer

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Engage Students

Alien Animal Adaptations: Tell students they are astronauts in the 31st century. The Intergalactic Space Agency is sending each of them to one of four newly discovered planets. Planet Steamy is covered by rain forests; Planet Brrrrr is covered by ice; Planet TooHot is covered by desert; and Planet Wet is covered by ocean.

Distribute the Aliens Adaptations activity master on p. T17. Assign each student a planet and tell them they have discovered a new species there. Have them describe the species by answering the questions on the activity sheet. Then ask them to draw a picture of the new species and label its unique adaptations that let it survive on its planet.

Afterwards, hold a "convention" of astronauts. Ask volunteers to report on their intergalactic trips and the species they discovered on these planets.

Explore Science

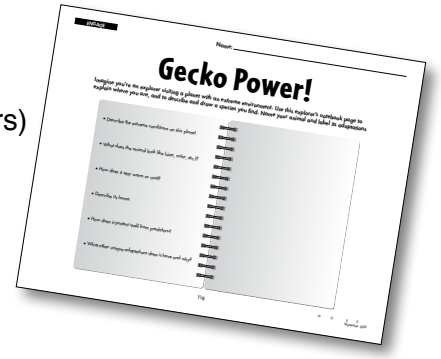
Divide students into three groups again. Repeat the Explore Science exercise from p. T4, this time assigning each group the following sections on pp. 6-7: "Terrific Tail," "Night Sight," and "Listen Up." Use their answers to continue to add details to the content web.

Hands-on Science: If possible, find a room that has no windows. (If not, ask students to try this at home at night.) Go into the room and turn out the lights. Ask students what they can see. If they can see any shapes, ask them what color the objects are. (They will look gray or black.) Tell students the dark room would look different to nocturnal geckos. Ask: *What can the geckos see that we can't?* (They can see colors in the dark.) Then ask: *How does this help geckos?* (They can see really well in the dark. That helps them spot danger and run away at night.)

Comprehension Quick Check

How does the gecko use its tail? (Possible answers: to help it balance; to distract predators)

Do all geckos have super night sight? (No. Some geckos are active during the day. They don't need the special kinds of eyes that nocturnal geckos have.)



Explore Science

Display the gecko side of the **poster.** Ask students to turn to the matching graphic on pp. 8-9 in their magazines. Ask volunteers to read aloud each information label. Then ask students to synthesize, or put together, what they've learned in order to answer the following questions:

- Which adaptation do you think is the most important to a gecko's survival? Why?
- Which adaptation do you think a gecko could lose and still survive fairly well? Why?

(Answers will vary. Remind students their answers should use facts they have learned about geckos from the story.)

Extend the Learning

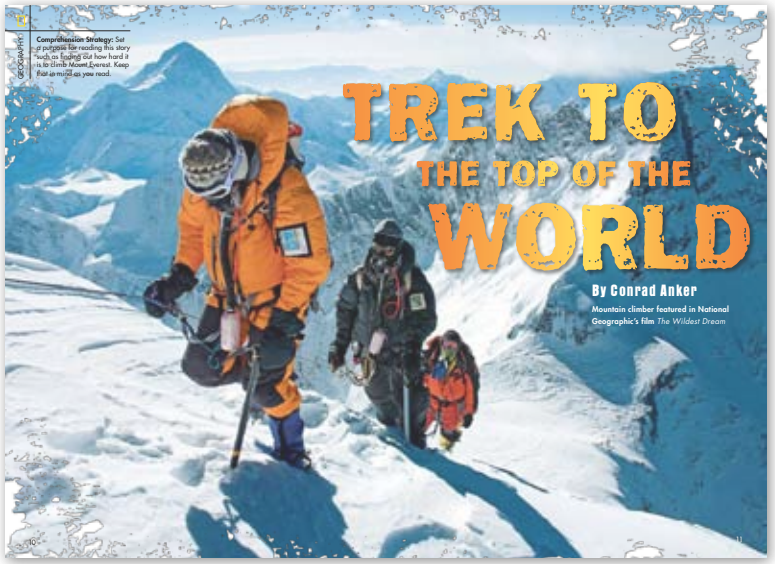
Adaptations: Remind students that all living things have adaptations that help them survive in their habitats. These may include: camouflage, abilities to survive in extreme climates, special ways to get food or defend themselves from predators. Have students work alone or in pairs to research the following animals and their adaptations. (Elephant, giraffe, kangaroo, shark, skunk, lion, or any others the students may be interested in.) Ask students to prepare a poster with the adaptations labeled and explained. They can draw the animal or find photos on the Internet, in magazines, or from other sources.

Critical Thinking: Explain to students that scientists are trying to create a super glue to use for medical purposes. They are studying geckos' toes to get ideas. Ask students to think about ways other animals' features could inspire useful products. Possible creature features include: spiders' webs, chameleons' color changing ability, eagles' vision, snakes' venom, etc. (You may want to explain that this is a real field of science called biomimicry. See the April 2008 issue of NATIONAL GEOGRAPHIC MAGAZINE or the January-February 2009 issue of EXTREME EXPLORER.) Share student inventions and decide which would be the most useful in our world.

Creative Thinking: What's in a title? Have students consider all that they learned in this story and review the title, "Gecko Power!" Explain that authors select titles that tell a little about the topic and will also make the reader want to read the story. Have students write three other titles that think would have been good for this story. Let students vote on the one they think is the best.

National Geographic Connections

Visit the National Geographic Museum in Washington, D.C., to see "Geckos: Tails to Toepads." The exhibit, which includes live geckos, runs from Sept. 24, 2010, to Jan. 5, 2011. For more information, go to: *http://events.nationalgeographic.com/events/exhibits/2010/09/24/geckos/*



Trek to the Top of the World

About the Story

How hard is it to climb Mount Everest? Ask Conrad Anker, a professional mountain climber featured in the National Geographic film, *The Wildest Dream.* In "Trek to the Top of the World," he traces his efforts to summit the world's highest peak. Along the way, students learn the science behind how the Himalaya formed and how changes in altitude affect Anker's health, as well as the plants and wildlife he sees as he climbs higher. This gripping tale will give students a new appreciation for the power of Earth—and the human body.

Before Reading

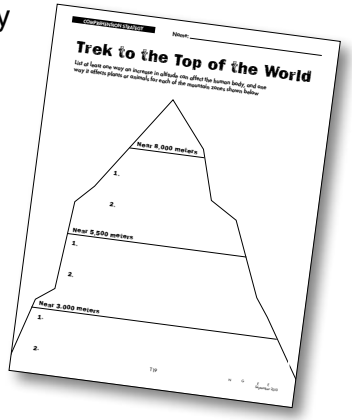
Preview and Set a Purpose for Reading Tell students that, just as for mountain climbers, planning for what lies ahead can help readers succeed, or better understand what they are reading. Before reading, ask students to scan the story, previewing the pictures, captions, headings, maps, and diagrams. Ask: *What do you think this story is about?* Guide students to understand that the story traces the dangers the author faced the higher he climbed.

Pair students and ask them to discuss what they learned in their preview and what information or details they want to look for in the story. Invite students to write a statement or question that summarizes their purpose for reading. Answers will vary. Display several responses.

Comprehension Strategy

Set a Purpose Remind students of the "purpose for reading" they came up with during the Before Reading exercise. Tell them that they will be looking for facts and information in the story that support their purpose for reading. Explain that non-fiction texts often include many details and it can be overwhelming for the reader. Using simple organizational tools can help a reader sort through the information and remember what's important.

After reading, distribute the comprehension activity on p. T18. Tell students that, as they reread, they should look for ways in which the rising altitude (or how high Anker is climbing) affects his health and the plants and wildlife around him. When finished, have students share their responses with a partner, making changes as needed.



Then display the **poster,** "Living at the Top." Ask students how the information is organized (by zones, based on distance above sea level.) Ask students to look for information to add to their graphic organizer.

Academic Vocabulary

Display the words: **altitude, jet stream, landmass,** and **sea level.** Have students rate their knowledge of each word as you say it aloud. (One finger = "I don't know what it means;" two fingers = "I've heard the word before but am not sure what it means;" Three fingers = "I know it and can use it correctly.") Invite volunteers from the last group to explain the meaning of a word and use it in a sentence. Review the definitions before moving on.

Then say: *When you previewed the story, you came up with ideas about what the story was going to be about. Turn to a partner and discuss why you think each of these words will show up in this story.*

Finally have students add these words to their Academic Vocabulary Log (see directions, p. T2).

Explore Science

Ask: *How are mountains formed?* (Tectonic plates collide, pushing up the land.) Then read aloud from p. 12: "The Himalaya keep growing. They push up a centimeter (half inch) a year." Ask: *If the Himalaya keep growing at this rate, how much taller will they be in 10 years? 50 years? 100 years?* Let students discuss how they would figure that out and then calculate. (To find the answers, use this formula: distance x years=total growth; answers: ten centimeters (five inches) in ten years; 50 centimeters (25 inches) in 50 years; 100 centimeters (50 inches) in 100 years.)

Next, direct students to the map on p. 13. Ask: *In what countries are the Himalaya located?* (China (Tibet), India, and Nepal; note: only refer to countries labelled on the map). *What symbol marks Mount Everest?* (+). *What two bodies of water are labeled on the map?* (the Arabian Sea and the Bay of Bengal)

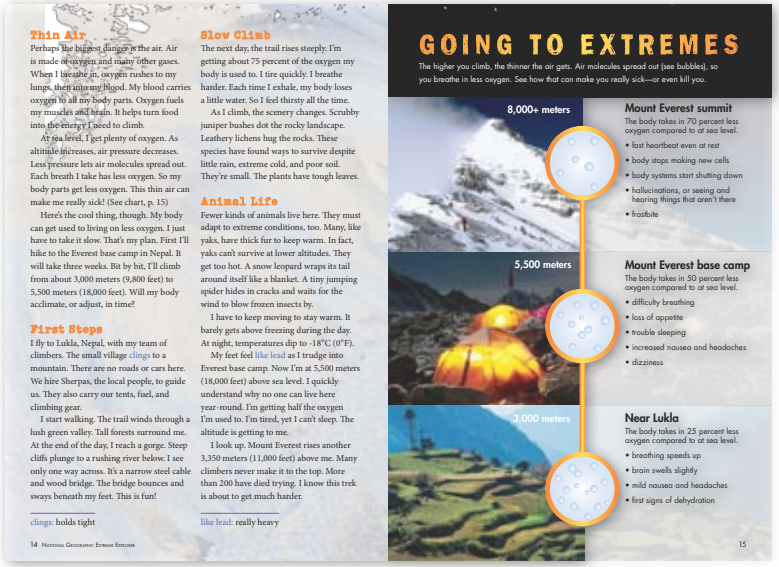
Finally, ask students: *How are altitude and temperature connected?* (The higher the altitude, the colder it is.) Ask students how the cold can put a climber at risk. (fingers, toes, and faces can freeze) As an added challenge, ask students why those body parts are most likely to freeze. (Answers may include: the face is exposed; toes and fingers are small with little body fat.)

Fast Facts

- Mount Everest is named after Sir George Everest, a British surveyor-general of India. Ironically, he never measured Everest nor climbed it.
- Thirty of the world's highest mountains are in the Himalaya mountain range.
- The oldest climber to reach the summit was 76-year-old Min Bahadur Sherchan of Nepal in May 2008. The youngest was Jordan Romero, 13, a California teen, in May 2010.

Comprehension Quick Check

What are some of the risks climbers face on Mount Everest?
(Glaciers, crevasses, steep cliffs, freezing temperatures, high winds, storms)



Thin Air

Perhaps the biggest danger is the air. Air is made of oxygen and many other gases. When I breathe in, oxygen rushes to my lungs, then into my blood. My blood carries oxygen to all my body parts. Oxygen fuels my muscles and brain. It helps turn food into the energy I need to climb.

At sea level, I get plenty of oxygen. As altitude increases, air pressure decreases. Less pressure lets air molecules spread out. Each breath I take has less oxygen. So my body parts get less oxygen. This thin air can make me really sick! (See chart, p. 15)

Here's the cool thing, though. My body can get used to living on less oxygen. I just have to take it slow. That's my plan. First I'll hike to the Everest base camp in Nepal. It will take three weeks. Bit by bit, I'll climb from about 3,000 meters (9,800 feet) to 5,500 meters (18,000 feet). Will my body acclimate, or adjust, in time?

First Steps

I fly to Lukla, Nepal, with my team of climbers. The small village clings to a mountain. There are no roads or cars here. We hire Sherpas, the local people, to guide us. They also carry our tents, fuel, and climbing gear.

I start walking. The trail winds through a lush green valley. Tall forests surround me. At the end of the day, I reach a gorge. Steep cliffs plunge to a rushing river below. I see only one way across. It's a narrow steel cable and wood bridge. The bridge bounces and sways beneath my feet. This is fun!

clings: holds tight

Slow Climb

The next day, the trail rises steeply. I'm getting about 75 percent of the oxygen my body is used to. I tire quickly. I breathe harder. Each time I exhale, my body loses a little water. So I feel thirsty all the time.

As I climb, the scenery changes. Scrubby juniper bushes dot the rocky landscape. Leathery lichens hug the rocks. These species have found ways to survive despite little rain, extreme cold, and poor soil. They're small. The plants have tough leaves.

Animal Life

Fewer kinds of animals live here. They must adapt to extreme conditions, too. Many, like yaks, have thick fur to keep warm. In fact, yaks can't survive at lower altitudes. They get too hot. A snow leopard wraps its tail around itself like a blanket. A tiny jumping spider hides in cracks and waits for the wind to blow frozen insects by.

I have to keep moving to stay warm. It barely gets above freezing during the day. At night, temperatures dip to -18°C (0°F).

My feet feel like lead as I trudge into Everest base camp. Now I'm at 5,500 meters (18,000 feet) above sea level. I quickly understand why no one can live here year-round. I'm getting half the oxygen I'm used to. I'm tired, yet I can't sleep. The altitude is getting to me.

I look up. Mount Everest rises another 3,350 meters (11,000 feet) above me. Many climbers never make it to the top. More than 200 have died trying. I know this trek is about to get much harder.

like lead: really heavy

14 National Geographic Extreme Explorer

GOING TO EXTREMES

The higher you climb, the thinner the air gets. Air molecules spread out (see bubbles), so you breathe in less oxygen. See how that can make you really sick—or even kill you.

8,000+ meters

Mount Everest summit

The body takes in 70 percent less oxygen compared to at sea level.

- fast heartbeat even at rest
- body stops making new cells
- body systems start shutting down
- hallucinations, or seeing and hearing things that aren't there
- frostbite

5,500 meters

Mount Everest base camp

The body takes in 50 percent less oxygen compared to at sea level.

- difficulty breathing
- loss of appetite
- trouble sleeping
- increased nausea and headaches
- dizziness

3,000 meters

Near Lukla

The body takes in 25 percent less oxygen compared to at sea level.

- breathing speeds up
- brain swells slightly
- mild nausea and headaches
- first signs of dehydration

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Explore Science

First help students visualize how oxygen works in their body. Read the first paragraph on p. 14. Then on a piece of paper, have students draw a flow chart showing the path oxygen takes as we breathe.

Then direct attention to the chart on p. 15. Ask volunteers to point out its features (meter labels; circles with oxygen bubbles; list of symptoms). Ask: *What information does each feature provide?* Explain the chart shows the health issues a climber may face as altitude rise and oxygen levels drop.

Ask students how the information in a chart might help them better understanding of the story. (Answers will vary) Challenge students to find out if Anker experienced any of these symptoms, and if so, during which stage of his climb.

Engage Students

Oxygen and the Brain: Have student go to the following PBS website where they can take tests similar to those climbers take as they climb mountains like Everest to determine how their brain has been affected by less oxygen. Some activities require they work with a partner.
www.pbs.org/wgbh/nova/everest/exposure/braintest.html

National Geographic Connections

To find out more about the National Geographic film, *The Wildest Dream,* go to *www.thewildestdream.com*.

Read more about Mount Everest, and National Geographic's 50th anniversary expedition to the summit in the May 2003 issue of National Geographic Magazine or by going to
http://ngm.nationalgeographic.com/2003/05/everest/everest-text

Comprehension Quick Check

How is oxygen used in the body?
(You breathe oxygen into your lungs. It goes into your blood. The blood carries it to all your body parts. The oxygen fuels them. It helps turn food into energy.)

What health problems do climbers face as they reach higher altitudes?
(dehydration, difficulty breathing, headaches, dizziness, nausea, frostbite, hallucinations, body systems shut down)

Yaks help carry heavy loads of climbers' gear and supplies to Everest base camp.

New View

Each day in base camp, I feel stronger. After two weeks, I'm ready. First, I head back down the trail. Why? I approached Everest from the south side in Nepal. The slow trek on foot gave my body time to adjust to the thin air. I want to climb the north side, though. I think it's more challenging.

I hike out, then take a bus right to the base camp in Tibet. It's almost as high up as the one in Nepal. I could have been really sick if I had driven straight here.

The land looks different. I'm on the world's highest plateau, or flat area. The Himalaya are so tall, they act like a fence. Clouds filled with moisture rarely make it past the peaks. So it's dry and few plants grow here.

Loose rocks slip beneath my feet as I hike up the Rongbuk glacier. I weave a path through spiky ice towers called shark fins.

Summit Bound

Soon I'm crunching across snow. I strap steel spikes called crampons to my boots. Now my feet dig into the ice. The trail gets steeper. In some places, it's almost vertical. *Wham!* I swing my ax into the ice, chipping out one step up at a time.

I reach a crevasse. A wobbly ladder crosses the gap. "Focus," I tell myself. One false step and I could fall to my death. My heart is pounding when I safely reach the far side. It's not just because of the thin air.

The climb is getting harder in other ways, too. I blow on my numb fingers to warm them. I feel out of breath just crawling into my sleeping bag. At least I don't have the dreaded climber's headache. It hurts so much, it's called a tomahawk.

We make our last camp at 7,900 meters (25,900 feet) above sea level. Now I'm getting a third of the oxygen I'm used to.

A climber balances on a horizontal ladder. It's the only way to safely cross this deep crevasse.

Into the Death Zone

My body is starving for oxygen. I'm slowly dying. Yet I'm so close to the top.

The night before we try to reach the summit, I share a cup of soup, some jerky, and a candy bar with another climber. It's all we can choke down. I toss and turn. At 1 a.m., it's time to go. We leave early to avoid storm clouds that blanket Everest late in the day. We carry oxygen in tanks. I instantly feel more alert and alive when I breathe in oxygen-rich air from the tank.

The sun rises as we reach the last big obstacle. It's that 30-meter (98-foot) cliff. I start climbing the rock face. Suddenly, my foot slips! I grab a rope for support. I'm safe. I try again. I keep telling myself: "Don't slip. Hold it together. This is it."

jerky: dried meat
choke down: swallow

To the Top

I climb. I drag myself over the top of the cliff. My muscles burn. I gasp for air. The summit is still 150 meters (500 feet) away. I trudge through the snow. The mountain plunges 3,050 meters (10,000 feet) on both sides of me. Step. Rest. Step. Rest.

Suddenly, I can't climb any higher. That's because I made it! I know it's risky to stay long. I take a moment to celebrate, though. Over two months of climbing, I've seen firsthand the power of Earth—and the human body. I'm on top of the world!

Wordwise

altitude: height above sea level
jet stream: high-speed current of air that blows east usually 6 to 15 kilometers (four to nine miles) above Earth
landmass: large, continuous area of land
sea level: level of the oceans' surface

Near the summit of Mount Everest, climbers use oxygen masks to get enough air to survive.

Explore Science

Point out to students that when Anker moves to the Tibet side of Everest, he's on the world's highest plateau. Ask: *What is a plateau?* (a flat area) Explain that a plateau is one of many landforms we have in our world. Conduct a lightning round of brainstorming as many landforms students can think of in one minute. (Examples from the story: mountain, gorge, cliff).

Challenge: Ask students to use online or print resources to find out what the difference is between a *plateau, mesa, butte,* and *table.*

Tell students to list any health symptoms Anker has related to the rising altitude. (numb fingers, out of breath, loss of appetite, difficulty sleeping.) Ask: *What's one problem Anker doesn't have?* (a bad headache)

Extend the Learning

Descriptive Language: Review with students that the use of descriptive adjectives, vivid verbs, and comparisons allows readers to better understand or "see" what the Anker is trying to explain. In this story the author uses a number of similes, or descriptive comparisons, and other vivid language. For example, on p. 12, he describes mountain building like this: "When they (the tectonic plates) collided, it was like pushing a rug against a wall. The land wrinkled and rose." Challenge students to scan the story to find other similes and vivid descriptions. (Examples: "My feet feel like lead." (p. 14); "Steep cliffs plunge to a rushing river below." (p. 14); "The Himalaya are so tall, they act like a fence." (p. 16))

Writing: Explain to students that a memoir is an autobiographical account of an author's experience. Then invite students to think about an "extreme" experience they have had in their life and describe it using their own voice to tell about the event. Remind students of the vivid language and descriptions used in "Trek to the Top of the World," and encourage them to use similar descriptive language in their own writing. Provide time for the reading of memoirs by any students who feel comfortable sharing.

"Living at the Top" poster: Display the "Living at the Top" poster accompanying the teacher's edition of EXTREME EXPLORER. Invite student volunteers to read aloud the descriptions for each zone. Pair students and have them do more research on what plants and animals live in each zone. Encourage students to make their own poster that shows different elevation zones. They can draw, or paste photos they find on the Internet or in magazines, of the plants and animals that live in each zone.

Comprehension Quick Check

Why is the last segment of the Everest climb called the death zone? (Here, a mountain climber like Anker breathes in only a third of the oxygen he'd get at sea level; his body is oxygen-starved and slowly dying; the terrain is treacherous thanks to crevasses, cliffs, etc.)

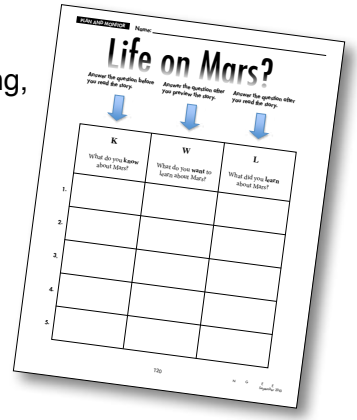
Life on Mars?

About the Story

Was there ever life on Mars? Clues to the answer may be here on Earth! Students will learn how scientists use what we know about Earth to understand Mars. They will see how, since we don't have the technology to send astronauts to Mars yet, scientists use creative thinking to learn about the red planet. They use data collected from such tools as telescopes, spacecraft, and rovers, and combine it with what we know about the forces that created Earth and life on Earth. Students couldn't have a better tour guide. Author Jennifer Eigenbrode is a space scientist with the National Aeronautic and Space Agency (NASA). She designed an experiment that will be on a rover headed to Mars next year.

Before Reading

Activate Prior Knowledge Explain to students that scientists often start with what they think they know about a subject, but are open to changing their views based on facts, or what they learn over time. Good readers can use a similar strategy to help them understand what they read. Have students think silently or brainstorm together about what they already know about Mars.



Distribute the KWL chart on p. T20. Before reading, have students write down what they **K**now about Mars and what they **W**ant to learn about Mars. Tell them that they will have an opportunity to come back to the chart after reading the story to write down what they **L**earned about Mars.

Comprehension Strategy

Ask Questions Remind students that most nonfiction texts provide new information and important facts. One way to make sure they understand what they are reading is to stop periodically as they read to ask and answer questions.

Model this strategy by reading the first section, "Mars on Earth" on p. 20 together. Ask: *What are the most important facts or ideas we just read?* (Mars is like the Arctic, a cold and barren desert. That means there are ways to study Mars right here on Earth.) *What information do I need to remember?* (Scientists once found a rock that came from Mars. It had tiny worm-like patterns. They wonder if that's a clue there once was life on Mars.)

Pair students and have them ask each other the same two questions after reading each section. Have them make brief notes to remind themselves of their answers. Tell students that if they can't answer both questions, they should reread the section to clarify their understanding. Point out that it is not unusual for students or adults to not "get" something the first time they read it, so they need to read it again.

Imagine walking on Mars. Red sand covers the planet. It's bitter cold. Yet rays from the distant sun could burn your skin. What an extreme place for a human explorer to go! In fact, no one has ever gone to Mars. We don't have the technology yet to safely send astronauts there. So space scientists like me find other ways to learn about Mars. I have many questions. I really want to know whether life ever existed on this mysterious planet.

Mars on Earth

That's one reason why I'm here in the Arctic with a team of scientists. The **geology** here is similar to that on Mars. Like parts of the Arctic, Mars is a cold and barren desert.

I'm here looking for rocks, too. On Mars, black rocks lie under the red sand. They have green crystals inside them. How did the crystals get there?

First, a volcano on Mars erupted. Melted rock from deep in the planet rose to the surface. As the rock cooled, green crystals formed. Later, a **meteorite** slammed into Mars. The impact threw chunks of rock into space. One made it to Earth.

Scientists found this space rock in Antarctica in 1996. They used special tools to study it. Inside, they found the green crystals. They saw tiny worm-like patterns, too. Was this proof life existed on Mars?

In the Arctic, I stand at the base of an ancient volcano. Icy glaciers surround me. I see green spots in a dark rock at my feet. I raise my hammer and bring it down hard. The rock cracks open. Inside, I find small green crystals. It's a lot like the Mars meteorite. That means this is one of the few places where I can study Mars without ever leaving Earth.

A swirling sandstorm blankets Mars. Some storms can last three months.

Planet Spotting

First, it helps to know a little about Mars. Have you ever seen it? Check out the night sky this September. Look for a red dot. Like other planets, it doesn't twinkle like a star.

Mars is the fourth planet from the sun. At its closest, Mars is about 55 million kilometers (34 million miles) from Earth. Its diameter is half the size of our planet's.

Mars looks different, too. From space, Earth looks like a pale blue dot. That's because water covers about 70 percent of Earth. Rocks and sand completely cover Mars. It looks red.

The weather on Mars is more extreme, too. Temperatures can drop to -125° Celsius (-195° Fahrenheit). Hurricane-force winds whip up the sand. That makes Mars's **atmosphere** look pink. Scientists have seen sandstorms so big that they cover almost half the planet. These storms can last for months.

The author takes rock and dirt samples in the Arctic. The geology here is similar to Mars's.

Mars is smaller than Earth. It looks different, too, thanks to its land features.

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Academic Vocabulary

Display the words: **atmosphere, geology, meteorite,** and **solar system.** Ask: *Why do you think these words could show up in a story about Mars?* Explain that their meanings, and how the words are used in context, can help explain why these words are in a space story.

Ask volunteers to find each word's definition and read it aloud. If necessary, draw their attention to Wordwise on p. 23. Then have students scan the story for each of the words in bold print and read how it is used in context. Have students turn to a partner and use each word in a sentence of their own that shows their understanding of the word.

Finally, have students add these words to their Academic Vocabulary Log (see directions, p. T2).

Explore Science

Have students look at the pictures on pp. 20-21 and read the captions. Ask: *What do you think it would be like to live on Mars?* (Answers will vary but could include cold or sandy.)

Then ask students: *When scientists talk about life on Mars, what does that mean?* Help students understand that they aren't looking for people like us or Martians like the creatures shown in science-fiction movies. Explain that "life" means anything that is, or was, a living organism. It can be as tiny as bacteria.

After reading both pages, ask students: *What have you learned so far about how Earth and Mars are alike and different?* (Mars is cold and barren; Earth is like that in some places; both have rocks with green crystals inside them. They are also very different: Mars is covered in reddish rocks and sand while much of Earth is covered in water; Mars is smaller than Earth and its weather is more extreme.)

Fast Facts

- Mars was named after the Roman God of War, probably because it is known as the red, fiery planet.
- Mars has two moons named after the Greek mythological sons of the God of War: Deimos ("flight") and Phobos ("fear").
- Mars has seasons because it has nearly the same axil tilt as Earth.
- NASA is an acronym for National Aeronautics and Space Administration.

Comprehension Quick Check

Why is the author in the Arctic?

(The rocks and landscape are a lot like Mars, so it's one of the places where she can learn about Mars without ever leaving Earth.)

The Grandest Canyon

One rover took a photo of rock layers inside a crater on Mars. It looks just like rock layers in Kansas (photo, top left).

Like Earth, Mars has volcanoes and canyons, too. On Mars, though, some are supersize. In fact, Mars has the biggest volcano in our **solar system.**

It rises 26 kilometers (16 miles) above Mars's surface. No volcano or mountain on Earth is as big. It is three times taller than Mount Everest, Earth's highest mountain.

The canyons on Mars are just as large. One cuts across the middle of the planet. It's about 4,000 kilometers (2,500 miles) long. That's close to the width of Australia.

This Martian canyon dwarfs Earth's Grand Canyon in every way. It's wider, longer, deeper, and older. It is, by far, the grandest canyon we've ever found.

Scientists compare photos of rock layers and formations on Mars to similar places on Earth.

Missions to Mars

Telescopes help us study Mars. They give us a good view—and more. Some have tools to measure the temperature on Mars. They even can tell us what gases are in its air.

Unmanned spacecraft help us get even closer to Mars. The first one went to Mars 50 years ago. Some have orbited the planet. Others landed. Some carried rovers that explored Mars's surface and took samples.

We've used these tools to take thousands of photos of Mars, too. We think the same geologic forces formed Mars and Earth. We can use these pictures to compare the planets' land features and learn about Mars.

A Water World

Mars also has places that look a lot like dried-up riverbeds. They twist and turn across its surface. That's a lot like rivers on Earth. These ancient riverbeds show that Mars once had flowing water.

There are other signs of water on Mars, too. We found patterns on a crater wall called Burns Cliff. They look like ripples of moving water. We think that many of the craters on Mars once had lakes in them.

Then there are some round rocks found on Mars (photo, bottom left). They look like iron oxide balls in Utah. Water formed these balls on Earth, and maybe on Mars, too.

dwarfs: is bigger than

A Curious Mission

We really want to know about water on Mars. Why? All life needs water to survive. If there was water on Mars, maybe there could have been life. Life needs more than water, though. It needs sources of energy and nutrients. Can we find clues that these existed on Mars, too?

We're trying to. Soon, NASA will send a new rover to Mars. It's called *Curiosity*. The countdown has started already. The rocket carrying *Curiosity* into space should blast off in October 2011. It will take about ten months to reach Mars.

Curiosity is the size of a large pickup truck. A crane will lower it gently to the surface of Mars. Once on the ground, it will start exploring. I am really excited about this new rover and what we might discover on Mars.

Rolling Out the Rover

Curiosity will do more than just take pictures. It has an entire laboratory in its belly. The lab will do experiments on Mars's air and rocks.

It's extra thrilling for me. You see, I designed one of the experiments on the mission. This experiment may give us new clues about the possibility of life on Mars.

The rover will study rocks formed by water. It will test them for certain chemicals life needs to survive. We also may find chemicals that could have been formed *by* life. If we do, what does it mean? We'll have our best clues yet that simple forms of life once lived on Mars.

Soon we may know if life exists or existed on our closest neighbor in space. That answer may launch a new mystery. Where else will we find life in our solar system?

WORDWISE

atmosphere: gases around a planet

geology: land formations and rocks

meteorite: stone or metal remains of a meteor that has fallen to Earth

solar system: the sun and everything that orbits around it

This is an artist's image of Mars's great canyon, Valles Marineris.

Explore Science

Ask students to think about what living organisms need to survive. (Possible answers include air, water, and food.) Then ask how that knowledge could help scientists find out if there is, or was, life on Mars. (If they find evidence of something like water, it could prove that it was possible for life to exist on Mars.)

Ask: *What evidence have scientists found that proves there was water on Mars?* (Ancient river beds, rocks showing ripple marks from moving water, craters that may have been ancient lakes, iron oxide balls similar to ones formed by water and found in Utah.)

Finally, ask students what technology they think is most useful when it comes to learning more about Mars. (Answers will vary.) Encourage them to use information from the story to support their opinion.

Engage Students

Tell students that they are NASA scientists examining the rocks collected on Mars by *Curiosity*. They analyzed the rocks and were shocked to find…what? Invite students to share their stories with the class. Discuss which stories seem like science fiction and which ones seem possible.

Extend the Learning

Language Arts/ESL: Tell students that in English we use the endings *-er* and *-est* to compare things we are talking about. Explain that *–er* means "more" and *–est* means "most." Then have students scan p. 22 to find examples. (Examples include: *biggest, taller, highest, wider, longer, deeper, older,* and *grandest.*) Ask: *How does the use of these comparisons help create a picture in your mind as you read?*

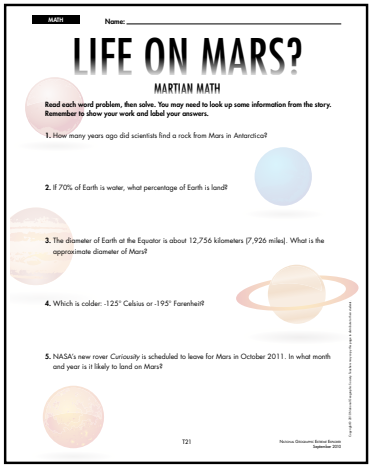
Martian Math: Distribute the Martian Math activity sheet on p. T21. Have students work alone or in pairs to solve each problem. Review the answers together. Ask students to explain step-by-step how they solved each problem.

WebConnect

Go to the NASA site http://marsprogram.jpl.nasa.gov/ to find information and activities about Mars. Click on "participate" on the home page for student activities, teacher materials, and additional lesson plans.

Comprehension Quick Check

What are scientists hoping to learn from sending the new rover *Curiosity* to Mars? (If chemicals found in Mars rocks could have supported life or been formed by life.)



MATH Name: _____

LIFE ON MARS?

MARTIAN MATH

Read each word problem, then solve. You may need to look up some information from the story. Remember to show your work and label your answers.

1. How many years ago did scientists find a rock from Mars in Antarctica?

2. If 70% of Earth is water, what percentage of Earth is land?

3. The diameter of Earth at the Equator is about 12,756 kilometers (7,926 miles). What is the approximate diameter of Mars?

4. Which is colder: -125° Celsius or -195° Farenheit?

5. NASA's new rover *Curiosity* is scheduled to leave for Mars in October 2011. In what month and year is it likely to land on Mars?

T21

 Name: _____

NATIONAL GEOGRAPHIC EXTREME EXPLORER

Get to Know Your Magazine

How good a magazine reader are you? Use your September issue of EXTREME EXPLORER to answer these questions and find out!

1. What is the name of this magazine? Where did you find the answer?

_____

2. What is the title of the third story in the magazine and on which page does it start?

_____

3. What does the deck on p. 2 of "Gecko Power!" tell you about the story?

_____

4. What magazine feature tells you what is going on in the photographs?

_____

5. Find a chart, diagram, or graph in a story. How does that help you understand the story?

_____

6. Look at the byline on the Mars story. What does it tell you about the author? How is that information helpful?

_____

7. Where in each story can you find information about new and challenging words? List two of these words that may be new to you.

_____

8. What stories will be in the October issue of EXTREME EXPLORER and how do you know?

_____

9. After previewing the magazine, what story do you most want to read and why?

_____

10. What is the website address for EXTREME EXPLORER. Check it out for more photos, games, and information!

_____

READ A MAGAZINE Name: answer key

NATIONAL GEOGRAPHIC Extreme EXPLORER

Get to Know Your Magazine

How good a magazine reader are you? Use your September issue of Extreme Explorer to answer these questions and find out!

1. What is the name of this magazine? Where did you find the answer?

Extreme Explorer; on the cover of the magazine.

2. What is the title of the third story in the magazine and on which page does it start?

Life on Mars?; p. 18

3. What does the deck on p. 2 of "Gecko Power!" tell you about the story?

Geckos are lizards. They can do things like run up walls and glide through the air.

4. What magazine feature tells you what is going on in the photographs?

The captions, which are on or next to each photo.

5. Find a chart, diagram, or graph in a story. How does that help you understand the story?

Answers will vary.

6. Look at the byline on the Mars story. What does it tell you about the author? How is that information helpful?

The author works at NASA, the U.S. space agency. She probably knows a lot about space and Mars.

7. Where in each story can you find information about new and challenging words? List two of these words that may be new to you.

In the Wordwise boxes at the end of each story and the blue words at the bottom of some pages.

8. What stories will be in the October issue of Extreme Explorer and how do you know?

Cool Corals, Kaboom!, and Extreme Cuisine; they are listed on the back page.

9. After previewing the magazine, what story do you most want to read and why?

Answers will vary.

10. What is the website address for Extreme Explorer. Check it out for more photos, games, and information!

Extremeexplorer.org (it's on the cover and back page)

Name: _____

Gecko Power!

Double Entry Journal

As you read, look for phrases or sentences that tap into your senses (what you see, hear, feel, etc.) Write the words in the first column. In the second column, draw a picture of what you saw in your mind as you read those words.

What I Read	What I Imagined

Name: _____

Gecko Power!

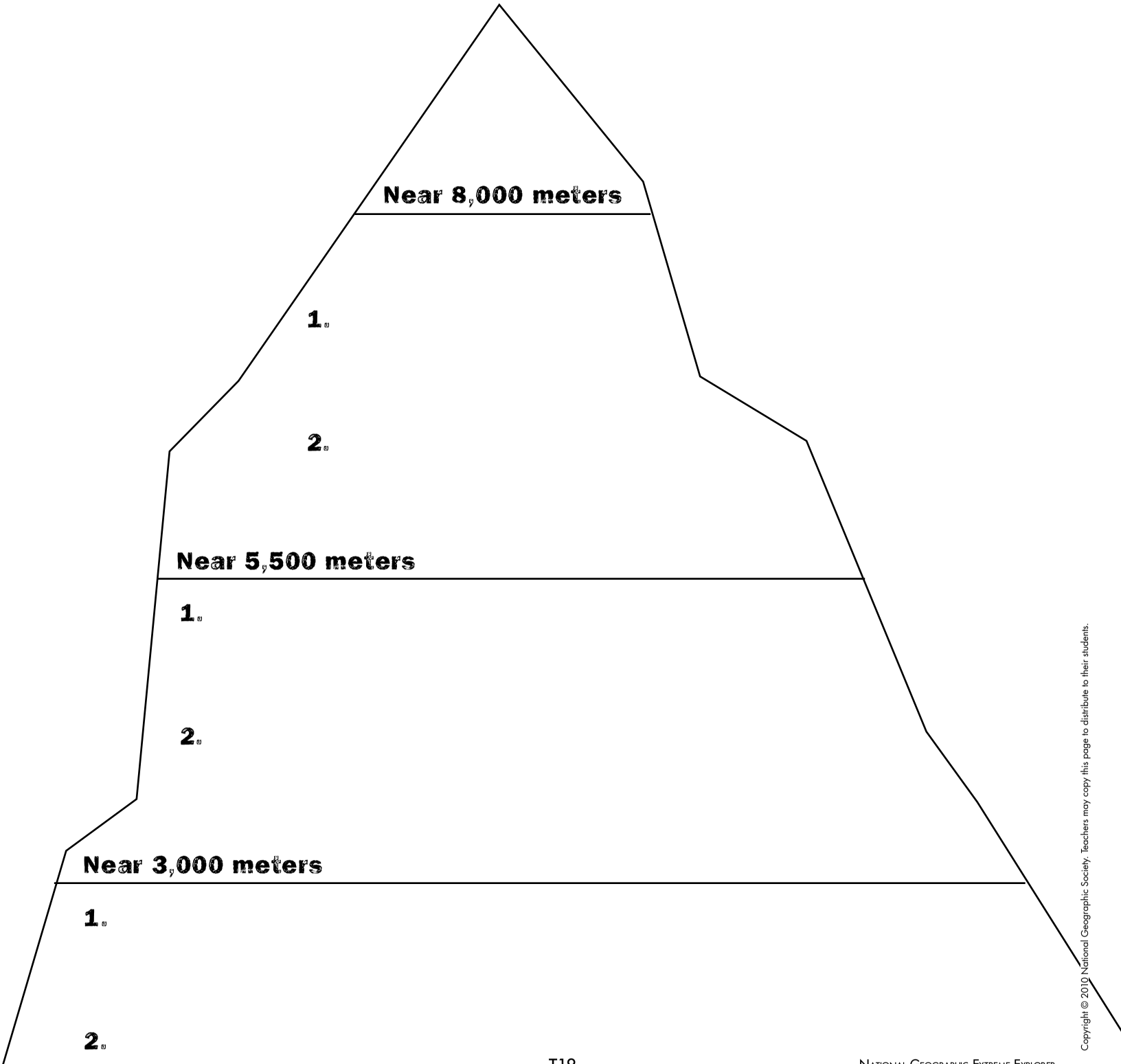
Imagine you're an explorer visiting a planet with an extreme environment. Use this explorer's notebook page to explain where you are, and to describe and draw a species you find. Name your animal and label its adaptations.

- Describe the extreme conditions on this planet.
- What does the animal look like (size, color, etc.)?
- How does it stay warm or cool?
- Describe its home.
- How does it protect itself from predators?
- What other unique adaptations does it have and why?

Name: _____

Trek to the Top of the World

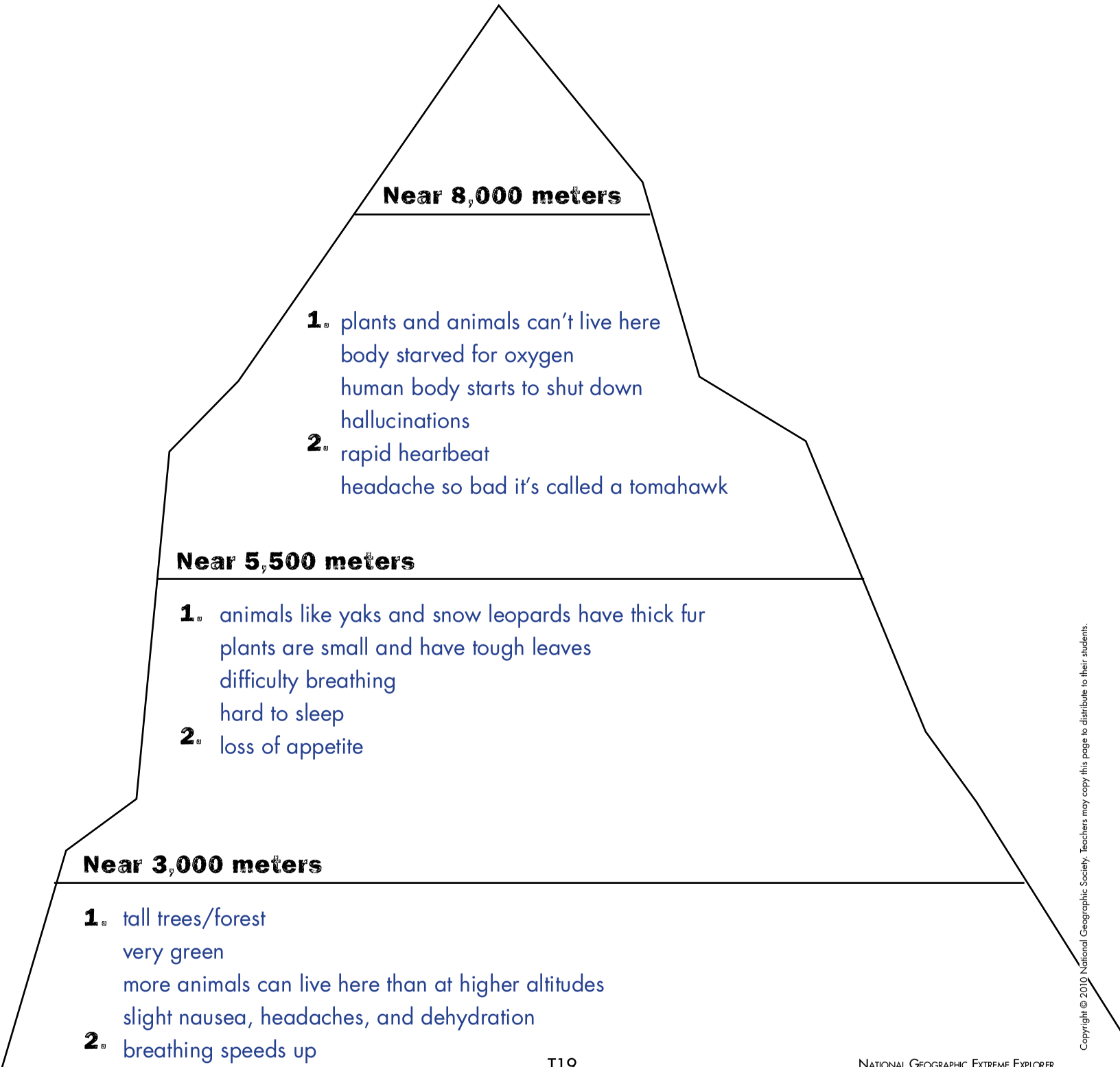
List at least one way an increase in altitude can affect the human body and one way it affects plants or animals for each of the mountain zones shown below.



Name: answer key

Trek to the Top of the World

List at least one way an increase in altitude can affect the human body and one way it affects plants or animals for each of the mountain zones shown below.



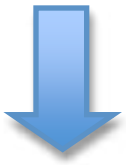
 Name: _____

Life on Mars?

Answer the question before you read the story.

Answer the question after you preview the story.

Answer the question after you read the story.



	K What do you **know** about Mars?	W What do you **want** to learn about Mars?	L What did you **learn** about Mars?
1.			
2.			
3.			
4.			
5.			

MATH

Name: _____

LIFE ON MARS?

MARTIAN MATH

Read each word problem, then solve. You may need to look up some information from the story. Remember to show your work and label your answers.

1. How many years ago did scientists find a rock from Mars in Antarctica?

2. If 70% of Earth is water, what percentage of Earth is land?

3. The diameter of Earth at the Equator is about 12,756 kilometers (7,926 miles). What is the approximate diameter of Mars?

4. Which is colder: -125° Celsius or -195° Farenheit?

5. NASA's new rover *Curiousity* is scheduled to leave for Mars in October 2011. In what month and year is it likely to land on Mars?

MATH

Name: answer key

LIFE ON MARS?

MARTIAN MATH

Read each word problem, then solve. You may need to look up some information from the story. Remember to show your work and label your answers.

1. How many years ago did scientists find a rock from Mars in Antarctica?

The story says the rock was found in 1996 (p. 20). It is now 2010. So, 2010 – 1996=14. Scientists found the Mars rock 14 years ago.

2. If 70% of Earth is water, what percentage of Earth is land?

First I start with all of Earth. So that would be 100% of Earth. If about 70% is water, I need to figure out what's left over. 100 – 70 = 30. That means about 30% of Earth is land.

3. The diameter of Earth at the Equator is about 12,756 kilometers (7,926 miles). What is the approximate diameter of Mars?

The story says the diameter of Mars is about half the diameter ot Earth (p. 21). So, 12,756 ÷ 2 = 6,378 (Or, 7,926 ÷ 2 = 3,963). The diameter of Mars is about 6,378 kilometers, or 3,963 miles.

4. Which is colder: -125° Celsius or -195° Farenheit?

According to the story (p. 21), they are the same temperature. Both are really cold!

5. NASA's new rover *Curiousity* is scheduled to leave for Mars in October 2011. In what month and year is it likely to land on Mars?

On p. 23, the story says it will take Curiousity about ten months to reach Mars. So, October 2011 plus ten months = August 2012.

REVIEW

Name: _____

Extreme Explorer

Comprehension Check

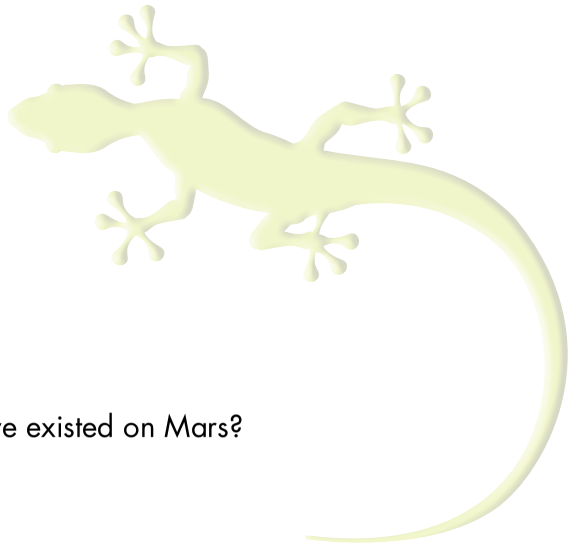
Write the correct letter of the word that matches each definition next to numbers 1-6.

___1. level of the ocean's surface
___2. the sun and everything that orbits around it
___3. remains of something that lived long ago
___4. behavior or body part that helps an animal survive
___5. gases around a planet
___6. height above sea level

a. adaptation
b. altitude
c. atmosphere
d. solar system
e. sea level
f. fossil

Read questions 7-9. Circle the correct answer.

7. Less oxygen at higher altitudes can produce which of these symptoms in climbers?
   A. difficulty sleeping
   B. breathing problems
   C. headaches and nausea
   D. all of the above



8. Which of these is **not** a gecko adaptation?
   A. super night vision
   B. ability to glide
   C. ability to swim underwater
   D. sticky toes

9. What evidence makes scientists think that life may have existed on Mars?
   A. extreme weather
   B. ancient riverbeds
   C. green crystals
   D. huge volcanoes

10. Imagine you're an explorer. Would you rather go to the top of Mount Everest or to Mars? Why and what are the three biggest challenges you might face?

_____

_____

_____

_____

REVIEW

Name: answer key

EXTREME EXPLORER

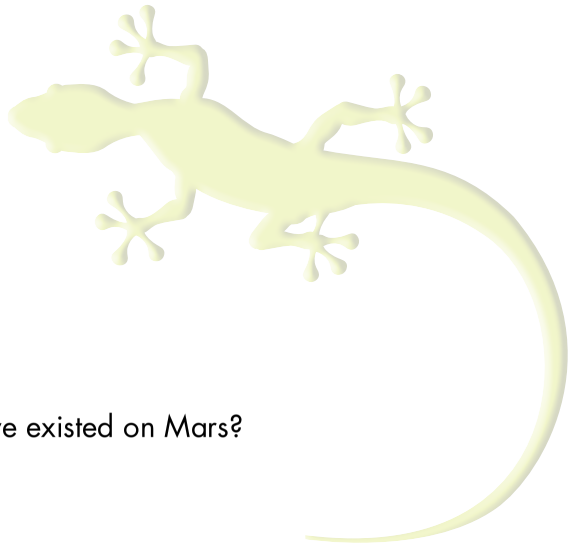
Comprehension Check

Write the correct letter of the word that matches each definition next to numbers 1-6.

e 1. level of the ocean's surface	a. adaptation
d 2. the sun and everything that orbits around it	b. altitude
f 3. remains of something that lived long ago	c. atmosphere
a 4. behavior or body part that helps an animal survive	d. solar system
c 5. gases around a planet	e. sea level
b 6. height above sea level	f. fossil

Read questions 7-9. Circle the correct answer.

7. Less oxygen at higher altitudes can produce which of these symptoms in climbers?
   A. difficulty sleeping
   B. breathing problems
   C. headaches and nausea
   (D.) all of the above



8. Which of these is **not** a gecko adaptation?
   A. super night vision
   B. ability to glide
   (C.) ability to swim underwater
   D. sticky toes

9. What evidence makes scientists think that life may have existed on Mars?
   A. extreme weather
   (B.) ancient riverbeds
   C. green crystals
   D. huge volcanoes

10. Imagine you're an explorer. Would you rather go to the top of Mount Everest or to Mars? Why and what are the three biggest challenges you might face?

Answers will vary.